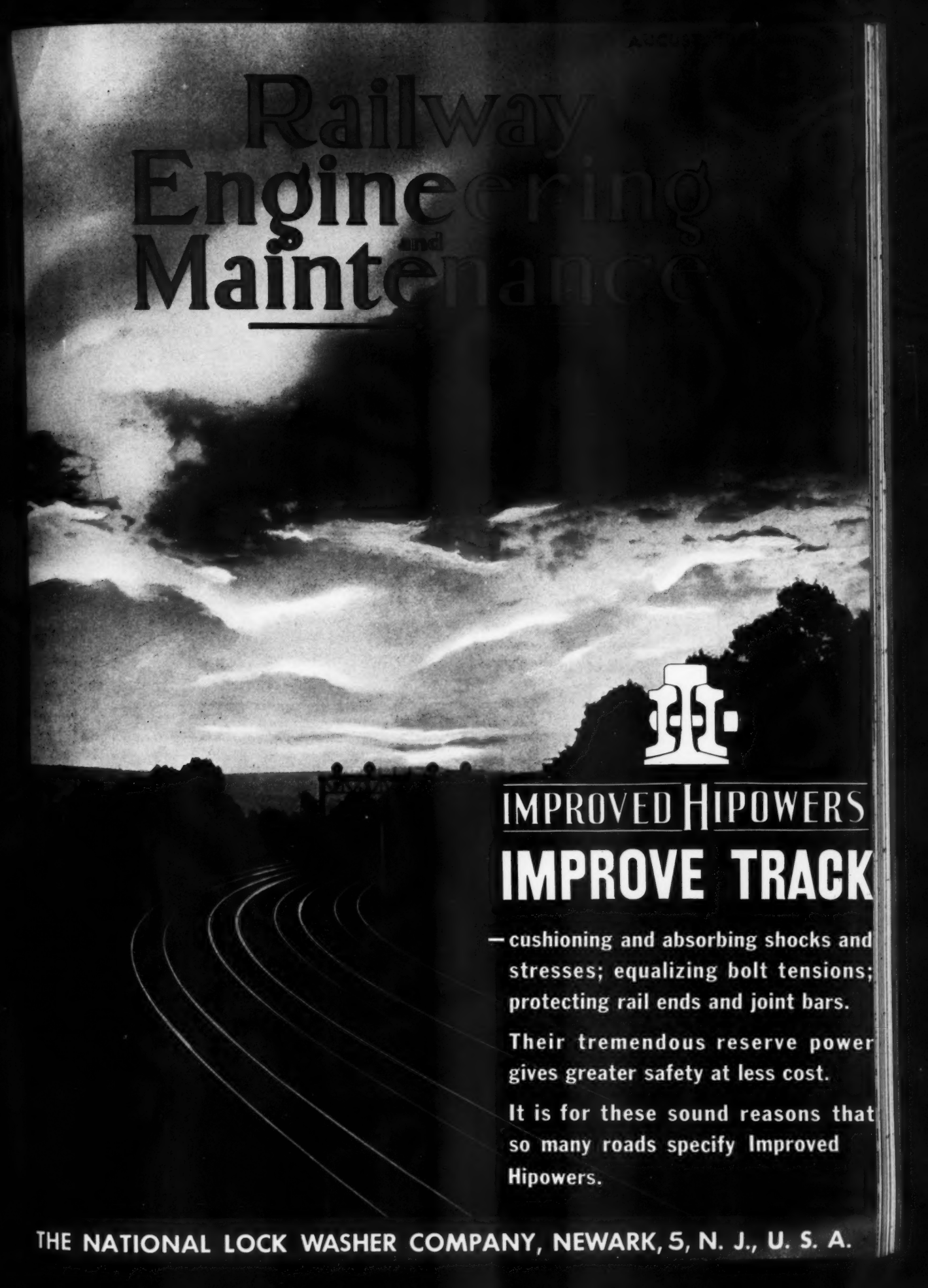


IMPROVED HIPOWERS

IMPROVE TRACK

— cushioning and absorbing shocks and stresses; equalizing bolt tensions; protecting rail ends and joint bars.

Their tremendous reserve power gives greater safety at less cost.

It is for these sound reasons that so many roads specify Improved Hipowers.

THE NATIONAL LOCK WASHER COMPANY, NEWARK, 5, N. J., U. S. A.

Here's where TRACK has to "TAKE IT"

"Edgemark of Quality"

The banging of cars being coupled, the sudden starting and stopping of shifters and long freights, put a heavy strain on track fastenings. But yard tracks can "take it" when joint bolts have Reliance Hy-Pressure Hy-Crome Spring Washers to help maintain their tightness.

Informed maintenance men have proved, in the yards as well as on main line track, Reliance Hy-Pressure Hy-Crome Spring Washers play an important part in cutting maintenance costs and keeping track joint bolts *tighter longer*.

Made from special-analysis steel, providing maximum spring power and fatigue resistance, Reliance Hy-Pressure Hy Crome Spring Washers possess reactive value which automatically compensates for looseness resulting from wear.

An interesting illustrated folder of Reliance Hy-Crome Spring Washers for track-work offers pertinent pointers on maintenance-of-way economy. Write for a copy.

EATON

EATON MANUFACTURING COMPANY

MASSILLON, OHIO

Reliance Division

Why we owe the engineer a new pair of shoes

Not long ago a railway engineer said to one of our Bethlehem men, "You owe me a new pair of shoes."

Asked why, the engineer replied, "I've been around kicking your 811 Rail Braces—kicking them hard. I didn't find a single one loose—but I just about ruined my shoes!"

This once, we'll be glad to furnish a new pair to the gentleman. However, experience being the best teacher, we doubt that he'll ever again use the same method to test tightness. The 811 Rail Brace *stays* tight.

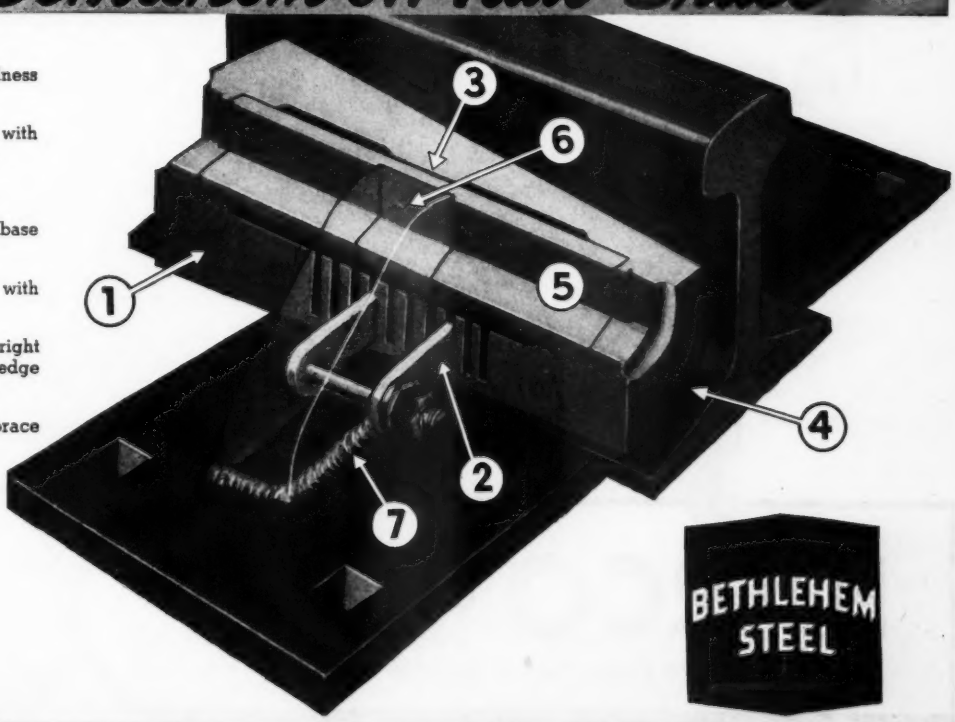
This simple, rugged device has a wedge that fits snugly into the contours of rail flange and web. On the outside the wedge is held rigidly in place by a thick, heavy brace that is welded to the switch plate. Synchronized pawls on the brace fit slots in the wedge, so that there can be no "creeping."

Another protective feature, providing for resiliency and recovery from side thrust, is the strong steel spring. This piece, which is integral with the wedge, will withstand a compression force of at least 20,000 pounds.

So you see, with 811's installed, it's a pretty hard job to find a loose one. If you'd like to see how they work, get in touch with the nearest Bethlehem district office.

Bethlehem 811 Rail Brace

1. Wedge. Brinell hardness of about 400.
2. Double pawl (forging) with synchronized action.
3. Compression stop.
4. Contours of wedge fit base and web of rail.
5. Steel spring, integral with wedge.
6. 1¾" heavy brace at right angles to plane of wedge surface.
7. Switch plate and brace held together by heavy weld.

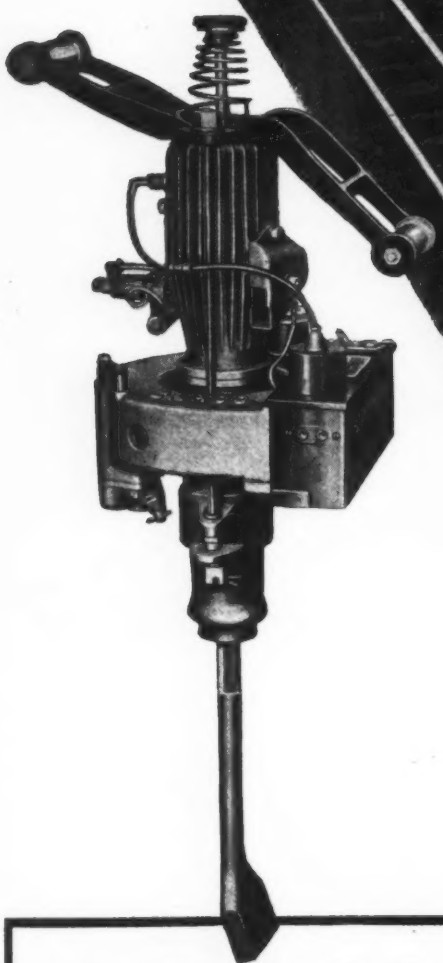


BETHLEHEM STEEL

Published monthly by Simmons-Boardman Publishing Corporation, 105 W. Adams St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00; Foreign $3.00. Single copies 35 cents. Entered as second-class matter January 20, 193[illegible] at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Mount Morris, Ill., post office. Address communications to 105 W. Adams St., Chicago 3, Ill.

Keeping Roadbeds Solid and True!

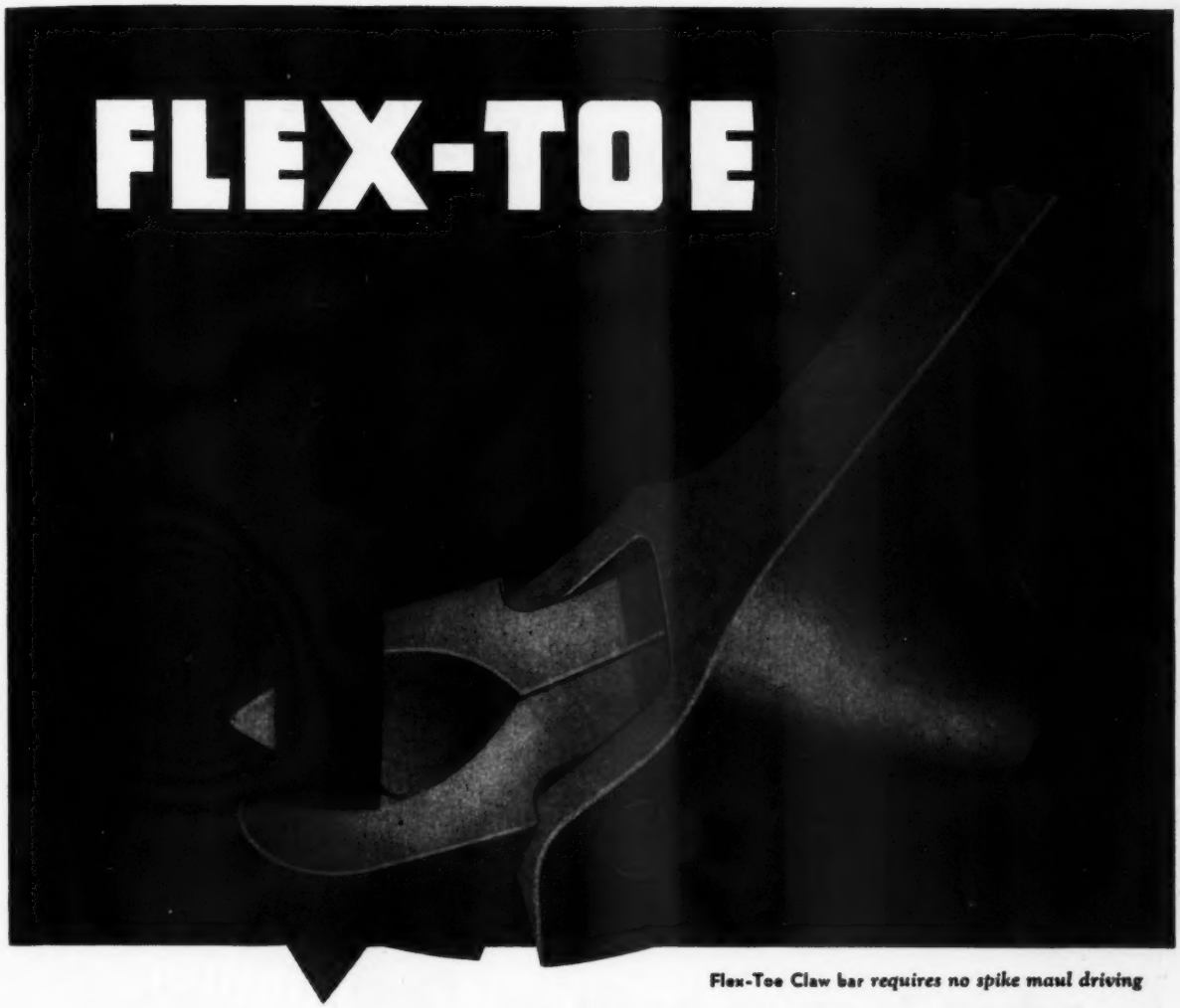
Thousands of miles of steel that sweep across the face of America are kept firmly anchored and true with Barco Tytampers. Roadbeds hold the surface and alignment longer because Barco is strong, tireless, carefully designed to handle the roughest kind of spot or gang tamping, cribbing, breaking, drilling. The men who use Barco find it light, easy to operate—a versatile machine that helps them get more work done. For full information, write to Barco Manufacturing Co., Not Inc., 1805 Winnemac Avenue, Chicago 40, Illinois.



BARCO UNIT TYTAMPER

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

FLEX-TOE



Flex-Toe Claw bar *requires no spike maul driving*

Quit driving stubs down through the ties . . .

Save your ties with Flex-Toe claw bars. Maintenance men have found that Flex-Toe bars will even remove spikes in tunnels where the heads have been eaten away by sulphur fumes.

Here is why! The Flex-Toe *grips* the spike. It is used in the same way as the AREA claw bar. Throw the Flex-Toe on the spike until the toes grip... lift the handle slightly, *then come down*—and as this is done, the bar grips and cracks the spike easier than any other bar.

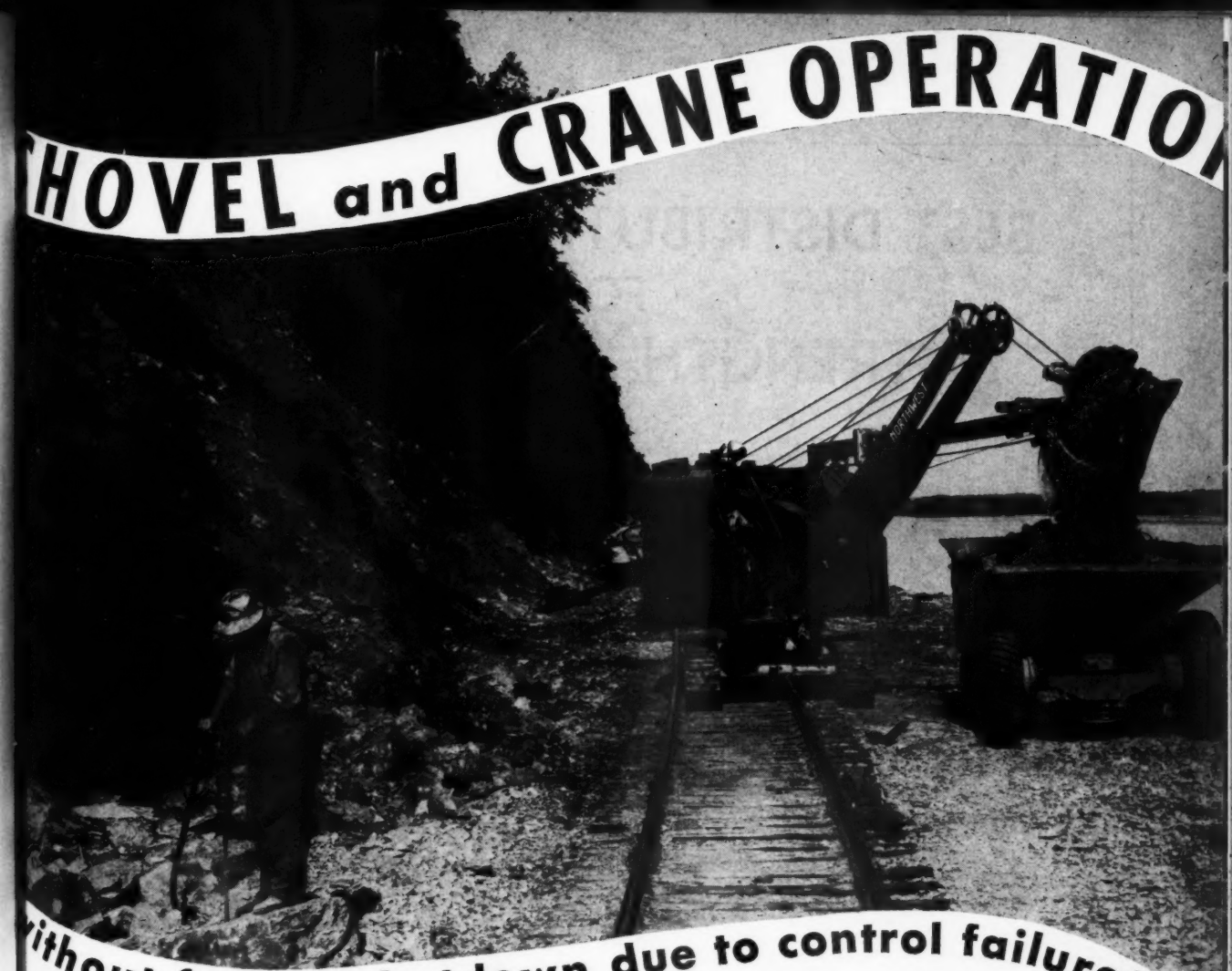
Fewer men pull more spikes; ordinary spikes, headless spikes, stubs, brine-eaten spikes, drift bolts, boat spikes come out easily. Write today for literature and prices.

WARREN TOOL CORP.

FACTORY - WARREN, OHIO

General Sales Offices - 105 W. Adams St., Chicago, Ill.

THOVEL and CRANE OPERATIO



ithout fear of shutdown due to control failure!

Northwest solved the problem of easy operation a long time ago. On a Northwest the heavy drum clutches are shifted by the power of the engine through a *simple mechanical device* — the Northwest "Feather-Touch" Clutch Control. Clutch action is in direct ratio to the movement of the operating lever and release is positive.

There are no high-pressure lines, no pumps, no tanks, nothing to refill or leak and it is not affected by weather or temperature.

It is simple, positive, dependable. It makes possible the ease of operation necessary to high output without any danger of shutdown due to control failure.

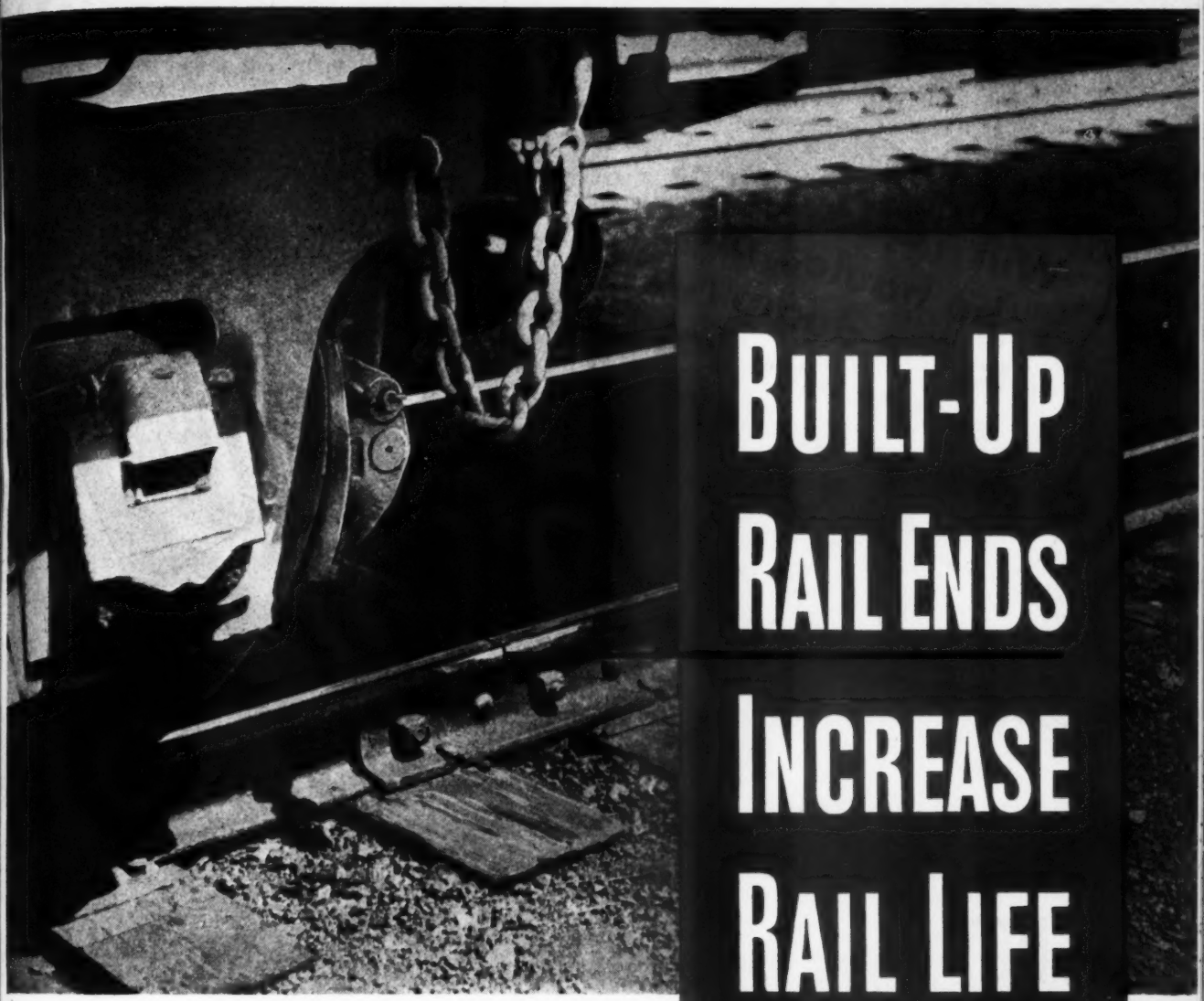
The "Feather-To Clutch Contro simple, positi dependable

NORTHWEST ENGINEERING COMPANY

1713 Steger Building • 28 East Jackson Boulevard • Chicago 4, Illinois

NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE



BUILT-UP RAIL ENDS INCREASE RAIL LIFE

• Building up battered rail ends with OXWELD MW welding rod increases the life of rail in first position from 50 to 100 per cent. Rail ends built up with this rod provide an armored surface that is more batter-resistant than the original rail metal. Worn rail and trackwork which has been restored to a true-riding surface results in reduced wear on ties, joint bars, and rolling stock. The work may be done in track with no interruption to traffic.

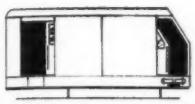
Ask an Oxweld representative to tell you about this and other cost-saving maintenance methods.

This rail end, built up by Oxweld's method, has a hard, smooth surface.

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
Carbide and Carbon Building Chicago and New York

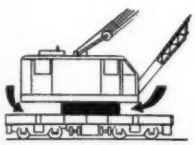
SINCE 1912 THE COMPLETE OXY ACETYLENE SERVICE FOR AMERICAN RAILROADS

Insist that your Locomotive Cranes have these SAFETY features:

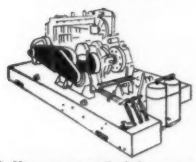


Sliding doors—never swing out

Wide vision—up, down and sideways



14" Safety Clearance between deck and carbody



Fully covered drives and gearing

Assure the security of your workmen AND your operations by buying "American" Locomotive Cranes. Whichever power is best for your purposes—Diesel, Diesel-electric, gasoline or steam—you will get a crane of utmost safety and efficiency, for each is separately engineered FROM THE RAILS UP to suit its particular power plant.

"AMERICAN" Locomotive Cranes are unique in the way they combine safe operation with speed and economy. Finger-tip air controls and oversize brakes provide perfect control at all times. Construction as a whole — trucks to booms — is extra rugged, preventing breakdown accidents as well as minimizing maintenance. Want details?

OLIVER *Quality*

makes your job easier

ALL ALONG THE LINE!

Crews work faster—get more done and have less spoilage with OLIVER . . .

- SCREW SPIKES
- DRIVE SPIKES
- TRACK BOLTS
- FROG AND CROSSING BOLTS
- GAGE RODS
- OTHER RAILROAD FASTENERS

. . . because OLIVER fasteners are dimensionally accurate, cleanly threaded and uniform. They assemble faster and give long life of complete satisfaction.

Save time and money all along the line—see your OLIVER Representative for complete information on our Railroad Fasteners.

OLIVER
IRON AND STEEL
Corporation

SOUTH TENTH AND MURIEL STREETS PITTSBURGH 3, PA.

FLAME CROWNING

RESTORES WORN AND SAGGING RAIL JOINT BARS

Effectively . . . Efficiently . . . in a matter of minutes

Many major railroads are now restoring rail joints to better riding surface by "flame crowning" . . . a modern oxyacetylene process that is simple, easy, quick . . . and economical.

The operation is performed by simply heating the angle bar at the proper point . . . to the proper extent with the oxyacetylene flame applied by two operators working on opposite sides of the joint and heating the center of the bar at the junction of the base and web. This procedure reduces the length of the rail-end weld required to restore uniform surface to the track.

For details of this improved process and other valuable maintenance-of-way suggestions, *fill in the coupon and mail it for a free copy of the new 32-page illustrated book — "Efficient Maintenance-of-way Operations with the Oxyacetylene Flame and Arc Welding."* You'll find it both interesting and helpful. Air Reduction, General Offices, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Co., Houston 1, Texas.

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Please send me a copy of "Efficient Maintenance-of-Way Operations with the Oxyacetylene Flame and Arc Welding."

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City_____ Zone____ State_____

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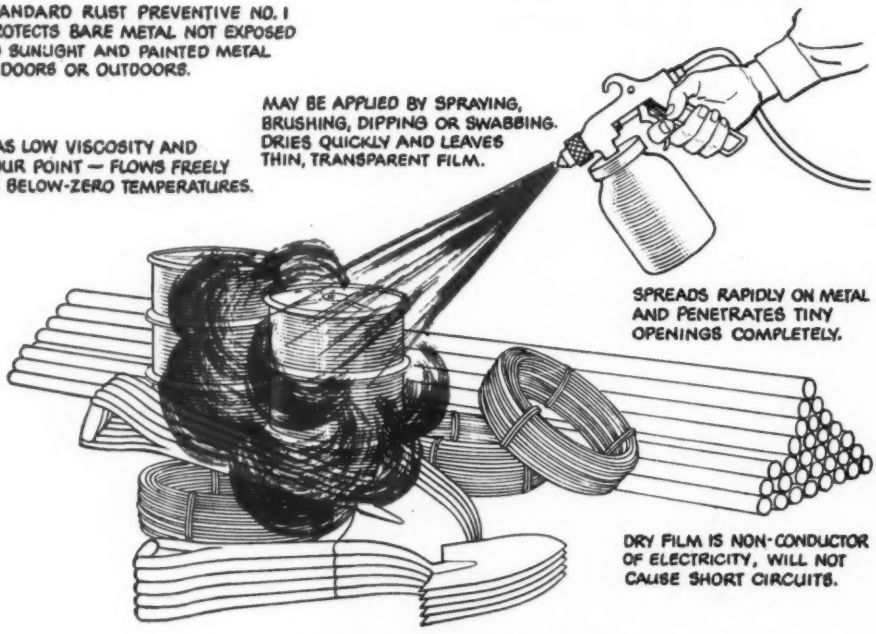
Offices in All Principal Cities

Costs Come Down Under the Airco Plan

STANDARD ENGINEERS NOTEBOOK

CALOL RPM



Rapid-drying Rust Preventive Cuts Treatment Costs

The time required to rust-proof stored metal equipment and parts is reduced to a minimum when Standard Rust Preventive No. 1 is used.

This is a thin, low-viscosity, dark brown liquid which dries almost instantly. It can be sprayed, brushed, and swabbed or applied by dipping. It leaves a thin, hard, transparent film.

Standard Rust Preventive No. 1 has unusual metal-wetting properties which allow a relatively small quantity to cover a large area rapidly. These properties also give it excellent penetration of even tiny cracks and depressions.

Paint on metal surfaces is not affected by Standard Rust Preventive No. 1. It will not soften the paint or cause it to blister and peel. Because of this and because paint adheres well to its hard film, it is not necessary to remove Standard Rust Preventive No. 1 before painting.

The film left by Standard Rust Preventive No. 1 is a non-conductor of electricity. After drying, it will not short circuit ignition wires.

Standard Rust Preventive No. 1 is primarily intended for use on metal kept under cover. Bare metal treated with it should not be exposed to direct sunlight or weathering action. On painted surfaces, however, especially where underlying paint is relatively porous, Standard Rust Preventive No. 1 has given fine service in severe outdoor conditions.

For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Col.; Standard Oil Company of Texas, El Paso, Texas.

FOR EVERY NEED A STANDARD OF CALIFORNIA JOB-PROVED PRODUCT

Off-Track Work

IS FASTER - CHEAPER *with*

MICHIGAN

Mobile SHOVELS-CRANES

Find out how MICHIGAN Mobile SHOVEL-CRANES can get your jobs done in shortest possible time at lowest cost—write today for Bulletin RE-86.

Work proceeds at greater speed with less delay to the job and to traffic. Time often wasted by ordinary equipment while awaiting passage of trains becomes *working time* when MICHIGAN Mobile SHOVEL-CRANE is on the job. This up-to-the-minute rubber-tired off-track equipment saves valuable time and manpower, reduces costs on a wide range of construction, maintenance and materials-handling jobs . . .

3/8 YARD AND 1/2 YARD • FULLY CONVERTIBLE
FINGERTIP AIR CONTROLLED CLUTCHES • ONE-MAN OPERATION

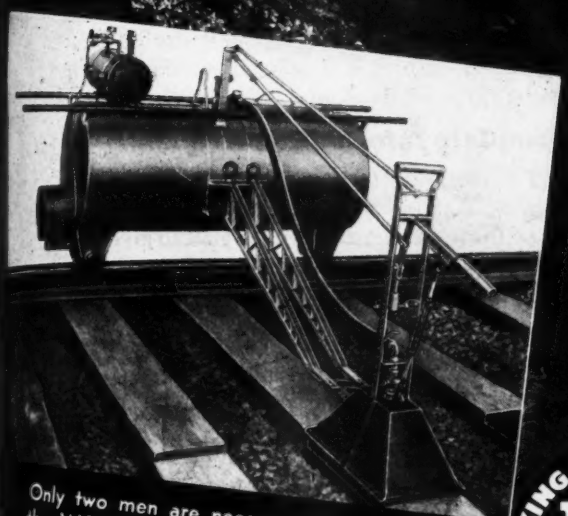
MICHIGAN

POWER SHOVEL COMPANY

BENTON HARBOR, MICHIGAN

CRACK TRACK

FOR CRACK TRAINS



Only two men are necessary to operate the WOOLERY Creosote Sprayer. The wind protection hood protects men against skin burns, and the finished job is of a uniform character far superior to hand swabbing or broom-and-pail method.

LINKING 13 GREAT STATES B&O WITH THE NATION

To maintain the sound, well-cared-for right-of-way essential to the high speed performance of feature trains like its Capitol Limited, the Baltimore & Ohio uses modern, efficient, labor-saving equipment, including the *Woolery Creosote Sprayer.*

This modern machine meters a predetermined amount of creosote each tie. The normal operation of lifting the hood by the han works the pump plunger and draws in a metered charge; pushing handle down forces the creosote out in a heavy fan-shaped sp thru a nozzle which sweeps through the arc of a circle coincid with the downward movement of the handle.

OVER 75 RAILROADS USE
WOOLERY RAILWAY MAINTENANCE EQUIPMENT

Tie Cutters **Creosote Sprayers**

Weed Burners
Available in 5-burner, 3-burner, 2-burner, and 1-burner models.

WOOLERY MACHINE COMPANY

MINNEAPOLIS — Pioneer Manufacturers of — MINNESOTA

RAILWAY MAINTENANCE EQUIPMENT

RAILWAY WEED BURNERS • MOTOR CARS • TIE CUTTERS • TIE SCORING MACHINES • RAIL JOINT OILERS • CREOSOTE SPRAYERS • BOLT TIGHTENERS

EXCLUSIVE EXPORT REPRESENTATIVES: PRESSED STEEL CAR COMPANY, INC., PITTSBURGH, PENNA.

...from tractor to work locomotive with ESCO track walking shoes

Your crawler-type tractor is doubly useful when it can mount the rails and work. It does the job of a powerful work locomotive — and supplies a new way to increase production and cut costs on railroad construction and maintenance.

ESCO track walking shoes enable a crawler-type tractor to work on the rails one minute, off the rails the next. When a train approaches the tractor gets off the rails, gets back on when the train has passed.

Working off the rails, the tractor can do all its regular jobs as usual. While on the rails, the tractor can

Operate live boom for laying rails
Haul ties and rails
Spot cars
Move track-mounted equipment at full tractor speed.

ESCO track walking shoes can be used on standard gauge railroad tracks, on any tractor with treads from 50 to 66 inches center to center. The wingdozer is designed for "Caterpillar" D6 and RD7, Allis-Chalmers 10, Cletrac 55, International TD18 and TD14.

If equipped with *ESCO* wingdozer, the tractor can grade, spread ballast, and skeletonize.

Complete Information Available

ESCO Bulletin 153 gives detailed information about track walking shoes and wingdozer. Your nearest *ESCO* representative will be glad to give you a copy and answer your questions, or write us direct.

ELECTRIC STEEL FOUNDRY

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These Grade Trade-marks on Douglas Fir Plywood mean Quality kept to rigid standards!

THERE is a type and grade of Douglas fir plywood manufactured especially for every building need. Each must meet rigid standards of quality. Current production is constantly inspected . . . constantly tested in the Douglas Fir Plywood Association laboratory. Choose the type and grade for **your** particular job by these "grade trade-marks," which appear on every panel. Use it with complete confidence; its dependability is backed by an industry-wide quality standard.

GENUINE
DOUGLAS FIR
PLYFORM
TRADE MARK REG. U. S. PAT. OFF.
Concrete Form Panel
D. F. P. A.
INSPECTED

PLYFORM is the special concrete-form grade of Douglas fir plywood — a quality grade manufactured with highly water-resistant glues and intended for multiple re-use in form construction.

EXT. - D. F. P. A.

EXTERIOR-TYPE plywood is made with completely waterproof synthetic resin binder especially for permanent exposure to weather and water. It is widely used for building exteriors, for outdoor signs, for railroad car siding, and in all phases of marine construction.

GENUINE
PLYWALL
TRADE MARK REG. U. S. PAT. OFF.
Douglas Fir Plywood
WALLBOARD
D. F. P. A.
INSPECTED

PLYWALL is the grade of interior-type plywood made especially for standard wallboard use. It is suitable for natural or stained finishes for painting or papering.

PLYPANEL D.F.P.A.

PLYPANEL is the grade of interior-type plywood made especially for high quality interior work on walls, ceilings, for booth partitions, cabinet doors and similar uses.

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M. R&S
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-PLYSCORD-
REG. U. S. PAT. OFF. PEND.
SHEATHING
D. F. P. A.
INSPECTED

PLYSCORD is an unsanded utility panel of unusual rigidity, made to withstand the rigorous service demanded of wall and roof sheathing and of sub-flooring.

DOUGLAS FIR
PLYWOOD
LARGE. LIGHT. STRONG.
Real Wood
PANELS

SUBSTANTIAL PRODUCTION NOW ALLOCATED TO VETERANS' HOUSING

Because the needs of the Reconversion Housing program are so acute, Douglas fir plywood is today being allocated. This means that a substantial proportion of the Douglas fir plywood industry's current production must go to housing contractors, stock cabinet manufacturers, prefabricators and distributors.

As a result, the supply situation for all other industrial and construction uses is temporarily a difficult one. It is a fact, however, that more plywood is being produced today than in pre-war years. Once the present overwhelming demand has been met, an ever-increasing supply for non-housing uses will be available.

Anticipate YOUR needs as far in advance as possible — and discuss those requirements with your regular source of supply.

Douglas Fir Plywood Association . . . *Tacoma 2, Washington*

Three Nordberg Adzing Machines in a rail laying gang on the Denver and Rio Grande Western.

The proper preparation of tie seats is one of the most important operations in the laying of rail. Rail laid on tie seats, all level and in the same plane, means better riding track, reduction in maintenance required and assurance that rail will not be damaged due to improper foundation. Machine adzing is a "must" in order to meet today's track standards. That is why Nordberg Adzing machines are found in the rail laying gangs of every Class 1 road in United States and Canada. This machine like the other track maintenance tools developed by Nordberg were designed to help you do a better quality of track work in less time with less men and at less expense.

USE THESE NORDBERG POWER TOOLS FOR YOUR TRACK MAINTENANCE WORK

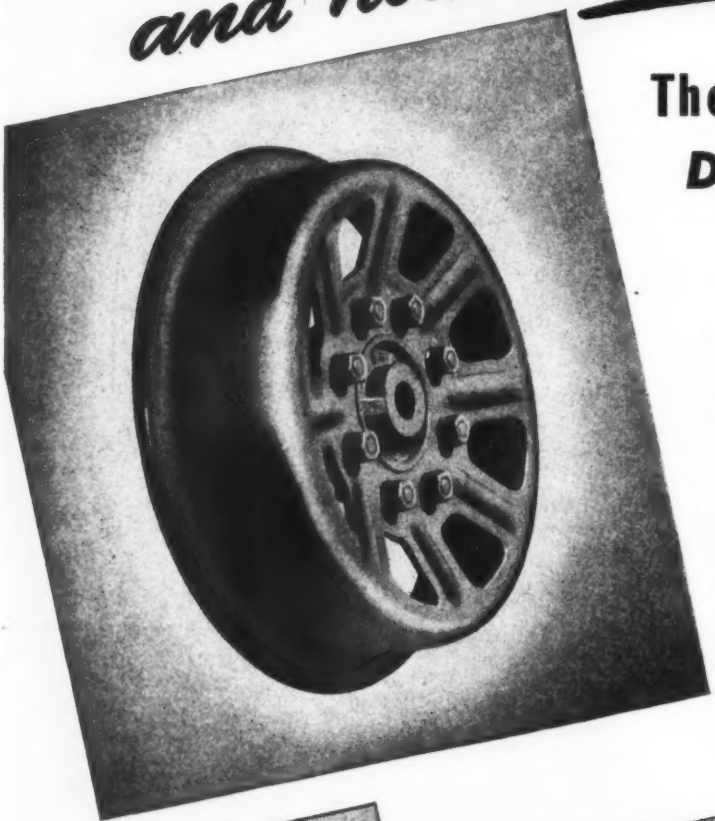
Adzing Machine	**Spike Hammer**	**Utility Grinder**
Spike Puller	**Power Jack**	**Surface Grinder**
Power Wrench	**Rail Drill**	**Midget Grinder**
Flexible Arm Grinder		**Track Shifter**

NORDBERG MACHINERY

NORDBERG MFG. CO. MILWAUKEE WISCONSIN

Export Representative—WONHAM Inc.—44 Whitehall St., New York

ALWAYS GOOD... *and Now Better Than Ever!*



The FAIRBANKS-MORSE *Demountable-Hub* WHEEL

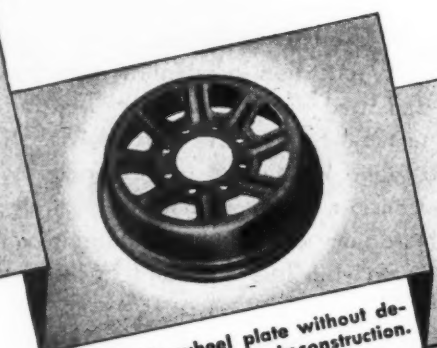
● Extra thickness and extra hardness at the areas of greatest wear—those are the exclusive new advantages of Fairbanks-Morse Sheffield-Steel Wheels for motor, trailer, and push cars.

These life-prolonging qualities result from cold-pressing with newly-designed dies on a 1500-ton press. Fairbanks-Morse controls every processing operation in the manufacture of these wheels. This assures absolute uniformity of the finished product.

The improved wheels conform to all A.R.E.A. standards. Absolutely concentric, they are available in insulated or uninsulated types, in 14-, 16-, and 20-inch sizes.

Write for bulletin. Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois.

Front view of die-forged steel demountable hub.



Demountable wheel plate without demountable hub. Note sturdy construction.

Fairbanks-Morse Motor Cars—"first on the rails and still first."

Fairbanks-Morse

A name worth remembering

Diesel Locomotives • Diesel Engines
Scales • Motors • Pumps • Generators
Magnetos • Stokers • Railroad Motor Cars and Standpipes • Farm Equipment

A complete package!

NEW LORAIN TL-20 COMES TO YOUR JOB READY FOR WORK

Choose your mounting and type of boom equipment and that does it! The TL-20, as a standard unit, comes to you with all the so-called "extras" built in, plus a lot more premium features never before offered by a machine in the ½-yd. class.

Check these features, then inspect a TL-20 at your nearest Thew-Lorain distributor. You'll find it a "complete package" full of many profitable surprises.

The Thew Shovel Company
LORAIN, OHIO

FIRST WITH THE FEATURES THAT COUNT

No Extras—all essential and desirable accessories (starter, generator, lights, etc.) are built as standard into every unit.

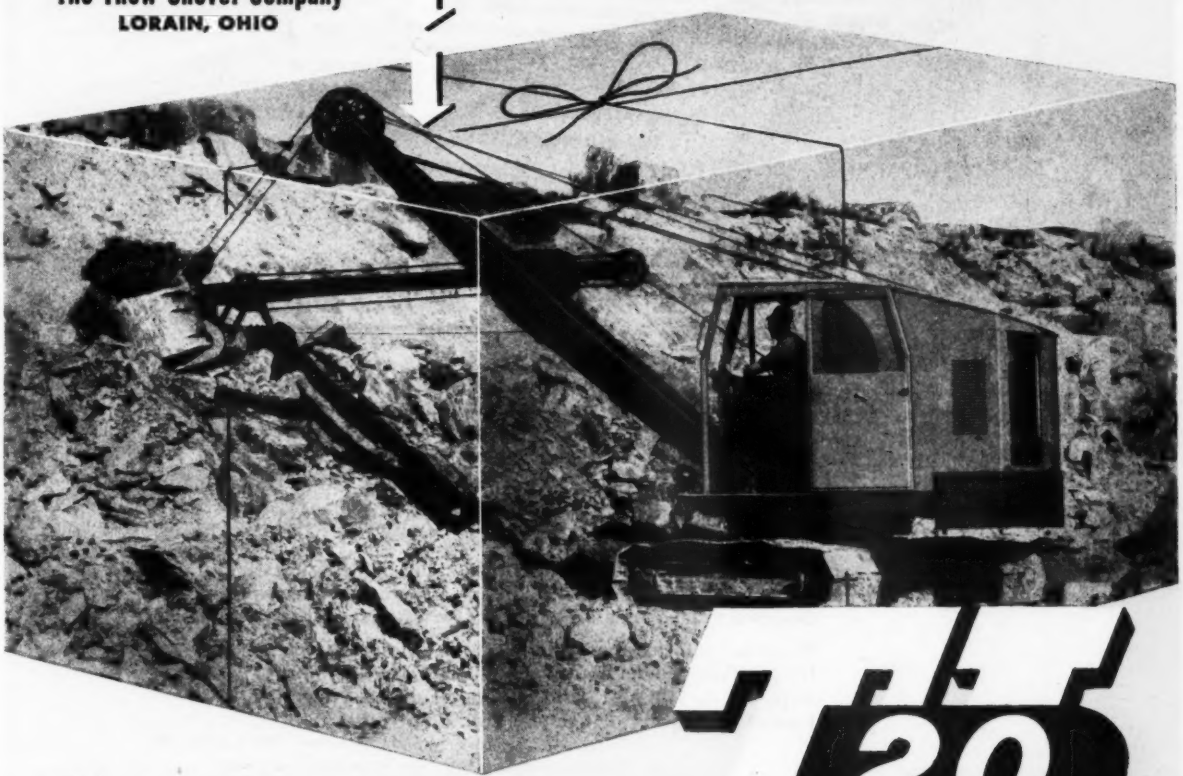
Unit Assembly—each major component (clutch shaft, engine, etc.) can be removed and interchanged as a complete unit.

2-Speed Crawler—2 speeds, standard equipment, available in both directions. Chain driven. Oil enclosed propelling mechanism.

Rubber-Tire Mountings—choice of nine mountings (Moto-Crane and Self-Propelled types) on 4 or 6 wheel units with or without front wheel drive.

5 Interchangeable Booms—available with interchangeable boom assemblies for shovel, crane, dragline, clamshell and hoe operation.

One-Piece Bed—turntable bed consists of a one-piece, all-welded, all-steel unit, which revolves on four Hook Rollers.

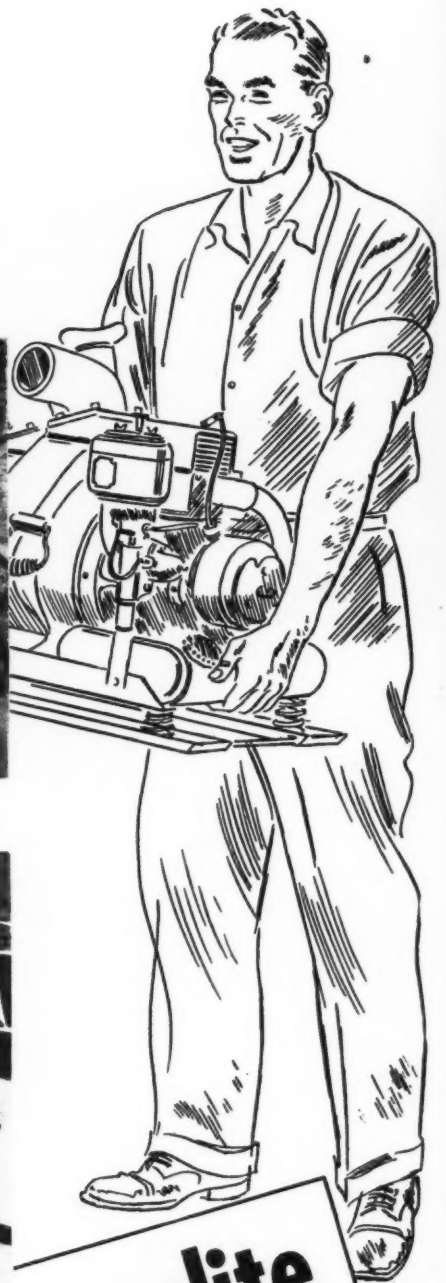


The NEW Lorain TL-20

Put These Pictures *into ACTION*

Above — Pump out water faster . . . handle heavy liquids and solids easier . . . with a fast self-priming Homelite Portable Pump.

Below — Operate electric tools . . . saws, grinders, drills and many others . . . with a Homelite Portable Generator. Use it also for floodlights on night jobs.



Do you want to see these pictures come to life? Do you want to see how you, like thousands of others, can cut operation costs . . . get more work done in less time . . . with Homelite Portable Gasoline-Engine-Driven Pumps and Generators?

Then write, *now,* and ask us to have a Homelite Representative arrange to give you a free demonstration. Without obligation to you in any way, he'll show you, *right on your job,* Homelite Portable Pumps and Generators *in action.* You ask him questions. Run the units yourself. You can find out everything you want to know about their design and operation. You can see, for yourself, just what you can expect in on-the-job performance. Write today.

Homelite
CORPORATION
Port Chester, New York
Portable Pumps Generators and Blowers
GASOLINE-ENGINE-DRIVEN

To Do A Real Job of Tamping

ACTUAL PHOTO OF TAMPER IN ACTION

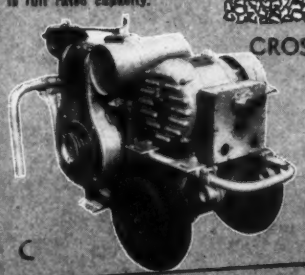
You've got to GET WAY UNDER Both TIE & RAIL

JACKSON VIBRATORY Tampers are IDEALLY DESIGNED for THIS PURPOSE

CROSS SECTION VIEW OF ACTION

JACKSON M-2 POWER PLANT

— one of several models equipped with the new trouble-free, no-maintenance, permanent magnet generators. Capacities: 1.25 to 5 K.V.A. (Continuous duty) Single phase and 3 phase 115 Volt, 60 Cycle A.C. to operate 2, 4, 8 or 12 tampers or B&B tools to full rated capacity.



Obviously, it's much easier to insert the blade of a JACKSON Tamper way under the tie and rail than it is to similarly insert the blade of any straight shank tamper. That 10-inch offset in the line of blade and handle eliminates the necessity of a contortionist's bend on the part of the operator — encourages him to do the job as it should be done. And that's just one of many reasons why experienced track men prefer JACKSONS! Why they'll put up more track of better, longer-lasting quality with JACKSONS than with any other equipment.

With a rising wage scale and a tremendous job to do, the speed and labor saving features of JACKSON Vibratory Tampers are increasingly important factors. Let us send you complete information on this equipment and how to use it most effectively.

ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Mich.

STREAMLINED TRAFFIC Means STREAMLINING MAINTENANCE

ALL ALONG THE LINE . . . in every phase of railroad operation . . . new, streamlined methods and equipment are being adopted by forward looking railroads.

The new Athey W4-5 MobiLoader, mounted on "Caterpillar" D4 Tractors, is being hailed by many railroad officials as the answer to scores of maintenance problems. This versatile, economical unit is ideal for railroad right-of-way maintenance and material handling jobs as well as general utility uses.

The W4-5 Athey MobiLoader is hydraulically-controlled. It picks up its load at the front, travels in reverse, and discharges to the rear . . . then returns immediately for another load, requiring minimum time and space.

Investigate the advantages of equipping your tractors with economical Athey MobiLoaders. See your Athey-"Caterpillar" distributor for complete details, or write direct to Athey Products Corporation, 5631 West 65th Street, Chicago 38, Illinois.

With the NEW ATHEY W4-5 MOBILOADER

Athey APCOR Products

An interchangeable bulldozer blade can quickly be installed on the Athey Mobi-Loader, further extending your tractor's usefulness.

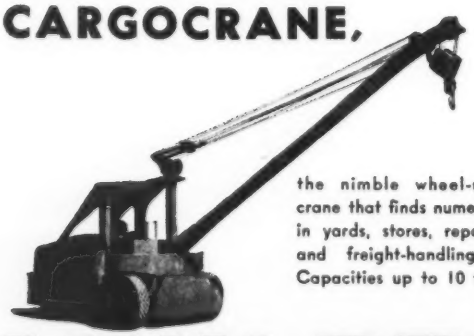
Athey

DEPENDABLE LOADING & HAULING EQUIPMENT

Off-the-Track Equipment PAYS OFF!

ADAPTABLE, MOBILE LINK-BELT SPEEDER MACHINES DO *More* WORK . . . *More Kinds* OF WORK . . . *More of the Time!*

Then There's the **CARGOCRANE,**



the nimble wheel-mounted crane that finds numerous uses in yards, stores, repair shops and freight-handling points. Capacities up to 10 tons.

Traffic and maintenance work proceed together—without interference, when modern, versatile Link-Belt Speeder machines are used. Quickly convertible to dragline, shovel, trench-hoe, pile-driver, or simple hook-block, they will perform a multitude of jobs of routine or emergency nature.

Railroad men appreciate the rugged construction that enables them to deliver trouble-free service, the power and smooth, efficient operation that accounts for high capacity for work.

Twenty-five models include a size for every requirement.

10,171

LINK-BELT SPEEDER

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

CLAY PIPE'S LONG LIFE ASSURES

THE BEST RAILROAD DRAINAGE AT LOW COST-PER-YEAR

THE BEST PIPE in the world for today's long-range heavy construction jobs, railroads, highways and airports is the one that lasts the longest at a low cost-per-year . . . Clay Pipe.

Clay Pipe is best because it is chemical-proof and abrasion-proof . . . it never wears out. Clay, nature's indestructible material, is processed by vitrification to create this everlasting pipe. With its variety of fittings, Clay Pipe is quickly and easily installed. Engineers, builders and maintenance men depend on Clay Pipe more and more for efficient, long-life drainage and sewerage.

Modern Construction Tip: Extra-strength Clay Pipe solves railroad drainage and sewerage problems where severe vibration from high-speed trains demands the use of structural materials with great strength and durability. Extra-strength Clay Pipe is invaluable wherever heavy vehicles roll . . . where heavy live or static loads must be provided for . . . where it must support heavy back-fill . . . where the trench is shallow . . . to eliminate cradling or casement costs.

It pays to specify Clay Pipe. You can always depend on it for long, trouble-free service.

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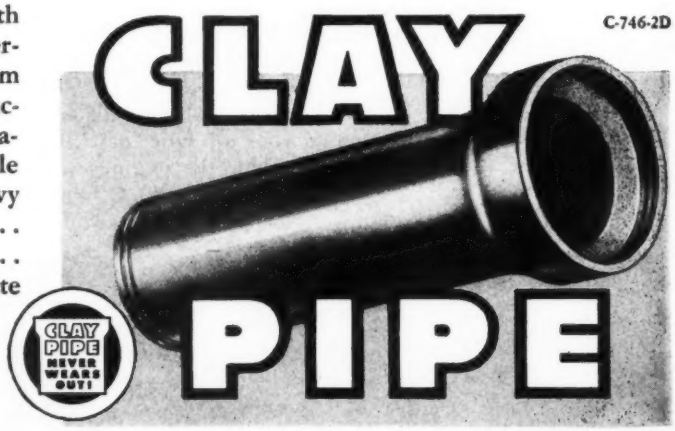
522 First National Bank Building, Atlanta 3, Georgia
1105 Huntington Bank Building, Columbus 15, Ohio
111 West Washington Street, Chicago 2, Illinois

C-746-2D



Red Lead is
ALWAYS Pb_3O_4... *that's why*
it's a Dependable Metal Paint

Industry has yet to discover a better metal protective paint than Red Lead. This is due to inherent fundamental properties of the pigment itself.

Among the most important of these are Red Lead's definite chemical composition and its purity, as distinguished from pigments that have indefinite composition or vary from batch to batch, with resulting possibility of variation in performance.

The reason for this uniformity is that red lead is a simple chemical compound—a combination of only two elements, oxygen and high-purity metallic lead. It is also an extremely pure compound, containing no corrosion accelerating impurities such as water-soluble chlorides or sulfates.

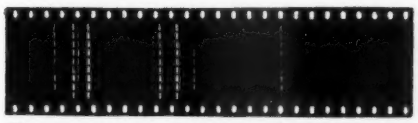
Uniform performance means predictable chemical behavior—dependable performance as a rust-inhibitive paint, day after day, job after job.

Furthermore Red Lead has the property of controlling acid conditions recognized as accelerators of rust. In the presence of various acids, Red Lead forms insoluble lead salts, at the approximate rate at which the acids are supplied. This is true whether the acids originate from acid forming environments, such as gas, smoke, and moisture in the atmosphere, or from the oxidation of the paint vehicle.

Remember, too, that Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including all the fast drying resins.

Specify RED LEAD
for All Metal Protective Paints

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.



***These spectograms** show the high degree of uniformity and purity of nine different batches of Red Lead. Each spectrum is a practical duplicate of every other. Such uniformity is an important reason for Red Lead's outstanding performance.*

* * *

Write for New Booklet — "*Red Lead in Corrosion Resistant Paints*" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

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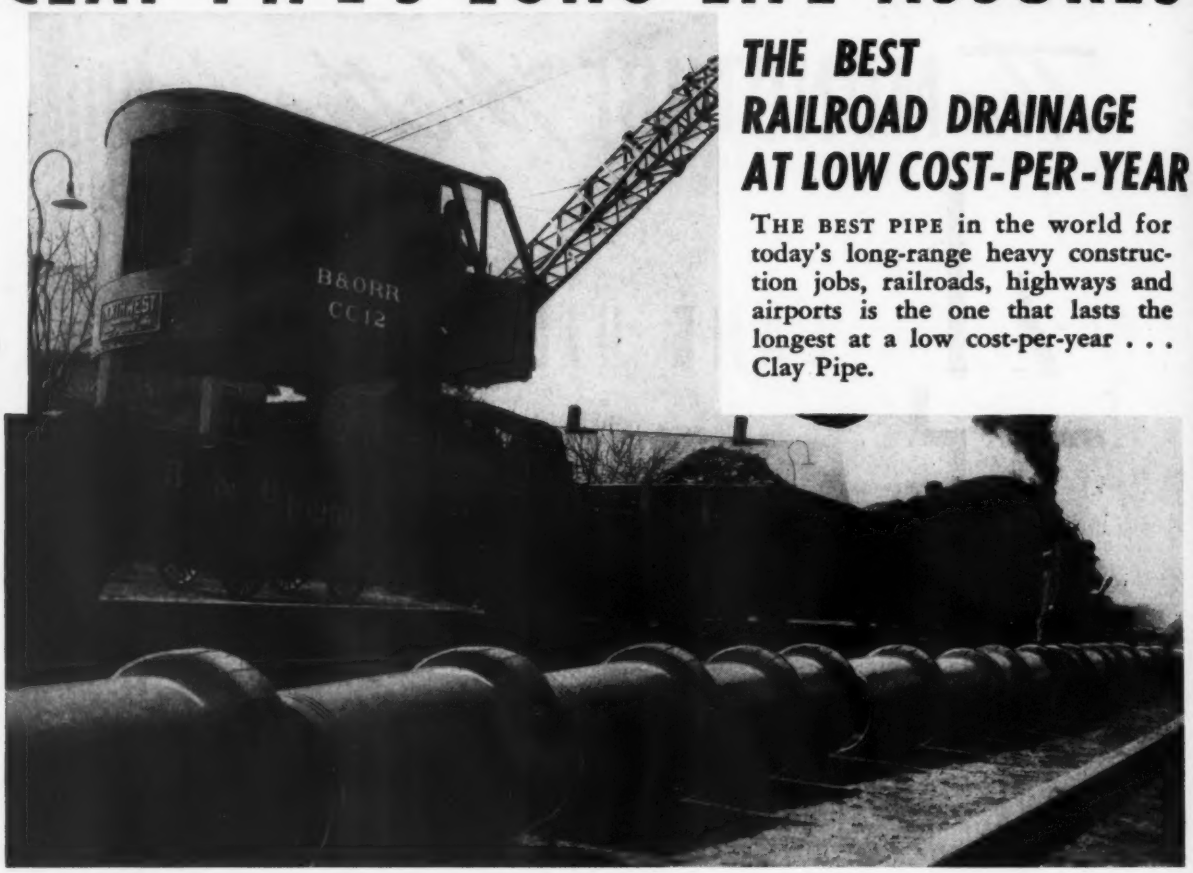
Dutch Boy
Red Lead

CLAY PIPE'S LONG LIFE ASSURES



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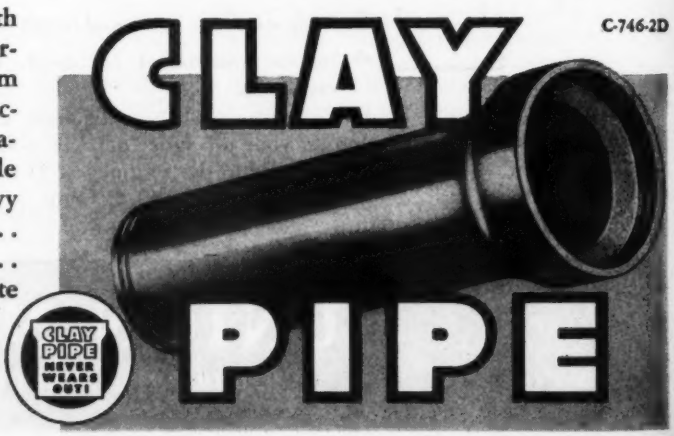

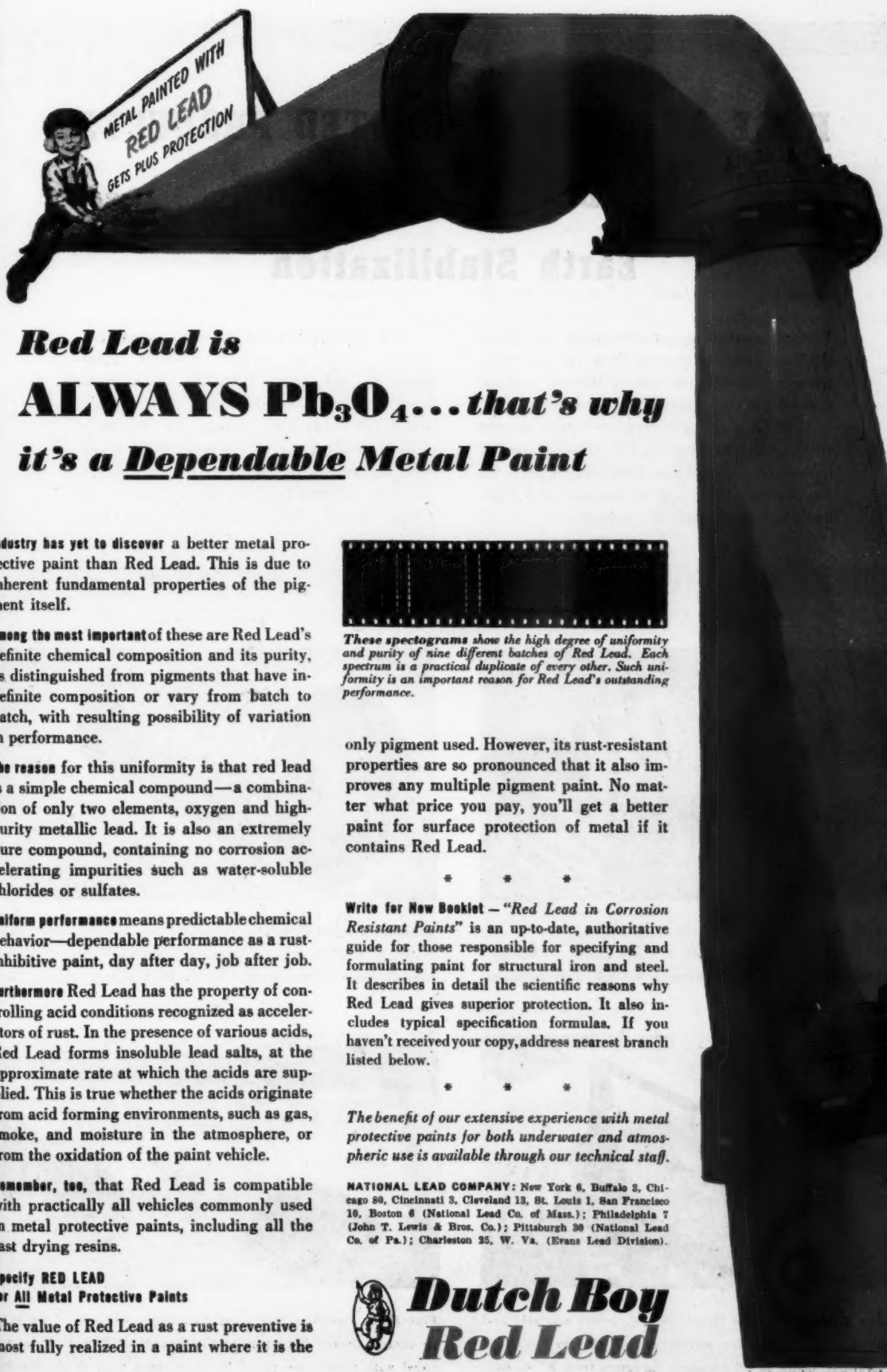

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Dutch Boy Red Lead

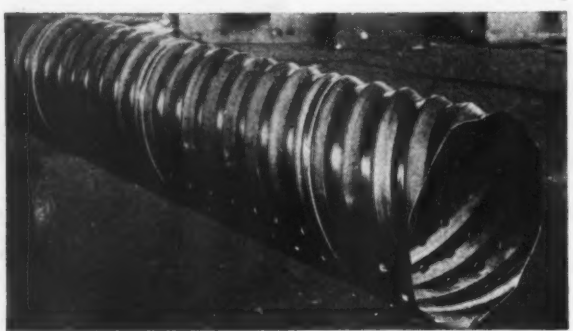
HERE ARE SERVICE-TESTED PRODUCTS for Drainage, Building, Earth Stabilization

Pictured on these pages are some of the Armco drainage products that can help you cut maintenance costs and assure more efficient drainage systems for your overworked roadbeds.

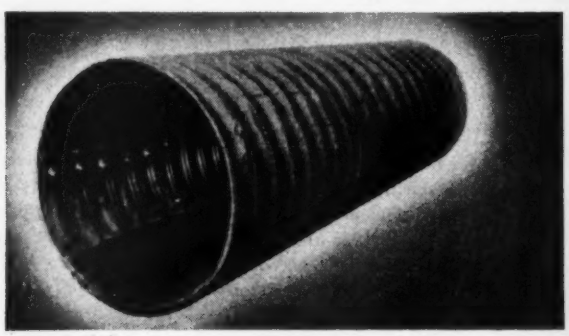
There is a size and type of Armco product for almost every surface and sub-drainage requirement. Other Armco products are ideal for wayside buildings, special conduits and pipelines, and earth retention problems.

Back of these special Armco products is a 40-year history of research and field experience. Trained Armco engineers are ready to draw on this specialized knowledge to help you get the job done quickly and effectively.

Remember, you can specify all Armco products with full confidence. Write us for data. Armco Drainage & Metal Products, Inc. and Associated Companies, 3765 Curtis St., Middletown, Ohio.



Perforated Pipe. Ideal for all kinds of subdrainage. This sturdy pipe has ample infiltration capacity, will not readily fill up with solids. It is made with circumferential or helical corrugations.

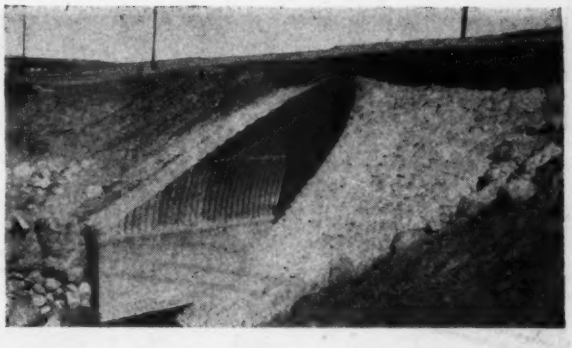


Asbestos-Bonded Pipe. This galvanized pipe is protected from corrosion by Armco's Asbestos Bonding process. If erosion is a problem, the pipe can be supplied with a thick bituminous pavement.

Drainage Gates. Used for flood control, sewer outfalls and reservoir outlets. Models for rectangular or circular openings. Calco Drainage Gates fit all standard diameters from 8" to 84".

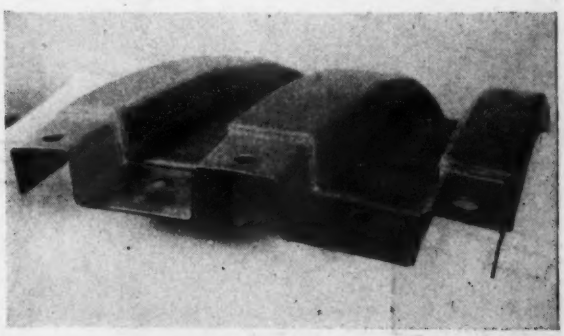
Pipe-Arch. Pipe-Arch has many advantages when used for low-clearance culverts. For many service conditions Pipe-Arch is provided with bituminous paved invert to resist wear in the bottom.

MULTI PLATE Pipe. MULTI PLATE extends the advantages of corrugated metal pipe into the 60" to 180" diameters. Easily erected with unskilled labor. Has ample strength for high fills.



MULTI PLATE Arches. For arches 5' to 25' and larger. MULTI PLATE provides flexibility, resistance to crushing under live loads, resistance to impact and vibration. Can be installed easily.

Spiral Welded Pipe. An electric fusion-welded spiral steel pipe for transporting water, oil and other materials. Diameters range from 6 to 36 inches, with wall thicknesses from 7/64 to ½-inch.



Liner Plate. Used for lining tunnels and shafts. These are corrugated, flanged circular segments that are bolted securely together. Armco tunnel liner plates are strong though light in weight.

STEELOX Buildings. Engineman's locker room in Ohio freight yard. STEELOX prefabricated buildings are made of steel panels with tight interlocking joints. They are durable, attractive, economical.

Retaining Walls. Rugged steel bins encased on all four sides. Earth or other material inside the bins assures sufficient stability. Walls prevent encroachment of streams or embankment slopes.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
and Associated Companies
MIDDLETOWN, OHIO

Why EVERY Curve Needs MECOlubrication

Curve elevation must be sufficient for *fastest passenger trains*, which is far more than necessary for *slow freights* —that's why practically *every* main-line curve needs lubrication.

MECOlubrication (1) Decreases Curve Friction (2) Reduces Wheel Flange Wear (3) Increases Curve Safety (4) Makes Curve Rails last as long as tangent rails. MECOlubrication increases the life of present and new curve rail, two to four times!

Installing MECOlubrication *now* is far-sighted Economy for Today AND Tomorrow.

- **Power Rail Layer** Requires No Train Orders.
- **Mack Reversible Switch Point Protectors** make switch rails last 8 to 10 times longer.

Maintenance Equipment Company
RAILWAY EXCHANGE BUILDING • CHICAGO, ILLINOIS

Here's the dirt on roadbeds...

and it's not good unless you get it out. The McWilliams "Mole" will clean your roadbeds for you quickly and efficiently. A crew of only four men can clean 850 to 1200 feet of shoulder in 8 hours with the shoulder model illustrated. Five men can do a similar job with the intertrack model.

RAILWAY MAINTENANCE CORP.

PITTSBURGH 30, PENNSYLVANIA

No. 212 of a Series

Railway
Engineering and Maintenance
SIMMONS-BOARDMAN PUBLISHING CORPORATION

105 WEST ADAMS ST.
CHICAGO, ILL.

Subject: Supply Men Optimistic

August 1, 1946

Dear Readers:

Many of you, I am sure, are trying to divine accurately the volume of activity to prevail in your departments during the next few years. Accordingly, I am sure that you will be interested, as I have been, in the following comment from a report of a recent rump session of railway supply men engaged in selling your departments.

"There was considerable talk regarding business prospects, especially in the maintenance of way field, for the next year. Significantly, there was not a single negative note evidenced by any one of the 14 men in attendance. Those dealing in track materials and equipment have been assured by their friends on the railways that they can look forward to several very active years, with a large outlet for their products. Those in the building field were especially optimistic for the next year or two. As a matter of fact, there was not a single segment of the entire group that did not talk in the same optimistic vein as regards the market in the maintenance of way and structures field."

And there are many other manifestations of the optimistic viewpoint of supply men toward the maintenance field. One of these is the keen interest which the supply industry has taken in developing new materials and equipment specifically for this field. This has been evidenced in the advertising and New Products pages of Railway Engineering and Maintenance in recent months, and is evidenced again in this issue.

Another definite manifestation is the demand for display space at the forthcoming exhibit of the Track Supply and B. & B. Supply Men's Associations, September 16-19, in Chicago, in conjunction with the simultaneous conventions of the Roadmasters' and Bridge and Building Associations. As reported in the Association News columns of this issue, 82 companies have already contracted for 133 booths at this exhibit and promise a display of materials and equipment, the like of which has never been seen before at any Roadmasters' or Bridge and Building convention.

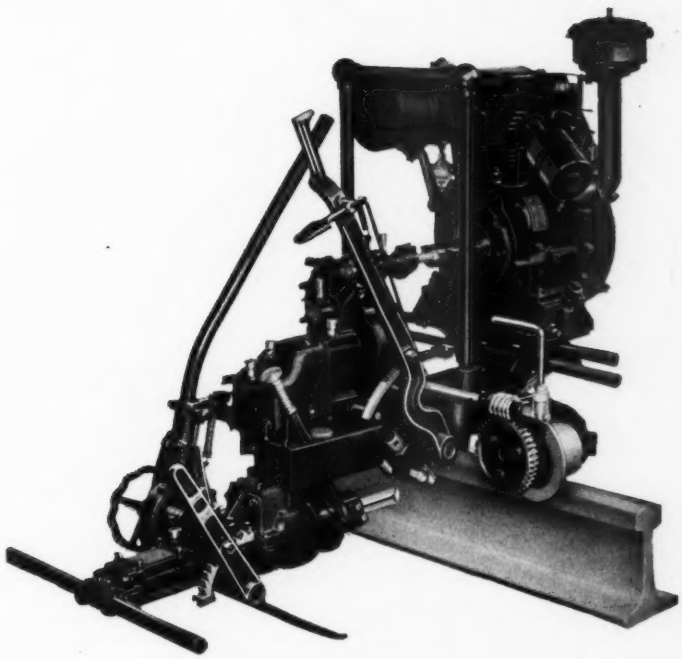
All this should indicate unmistakably to you that your friends in the railway supply industry have faith in you and in the railroads, and are making an all-out effort to help you in the solution of your problems. This is a healthy situation, which I am sure is appreciated by each of you.

Sincerely,

Neal D. Howard
Editor

NDH:jb

The EVERETT Power M-W Drill

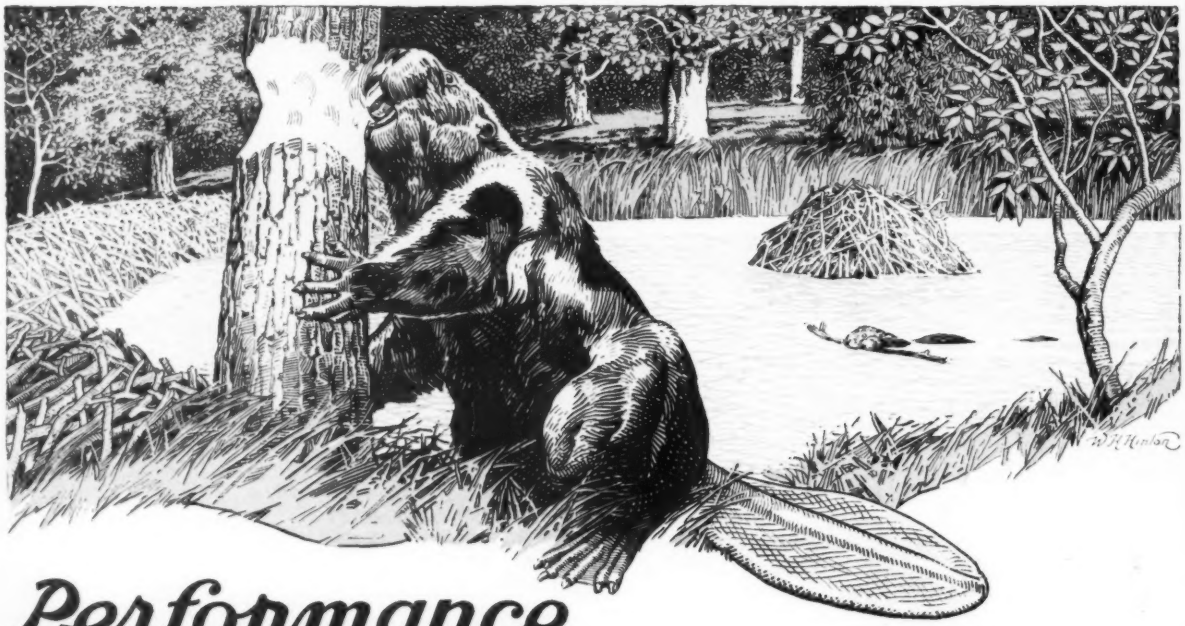


Requires but one rail and one man for its full operation. . . . Can be quickly freed and tilted off the rail by one man. . . . Clamps positively, either to rail or over angle bars. . . . Can be aligned with hole in angle bar, then positively clamped for drilling through angle bar hole. . . . Gives a clear view of angle bar hole or prick punch mark. . . . Has all needed adjustments which are quickly and accurately made. . . . Is quickly raised or lowered to exact vertical position by ratchet. . . . Has spirit level for leveling machine on tangent track. . . . Has force feed oiling device for oiling cutting edges of bits. . . . Has rack and pinion for feeding the bit, which long experience has proved the best method. . . . Operator has the "feel" of the bit, enabling him to avoid ruining bits. . . . Operator can also tell when bits need sharpening, avoiding excessive strain on thrust bearings or machine frame from forcing dull bits. . . . Keeps bits sharper longer. . . . Has behind it 20 years of development and satisfactory service. . . . Has splendid record of freedom from service interruptions and repair jobs.

Other Raco Machines:

Model B Raco Power Track Wrench
Model A Raco Power Track Wrench
Raco Tie Boring Machine

RAILROAD ACCESSORIES CORPORATION
CHRYSLER BUILDING NEW YORK



Performance INSURED BY Efficiency

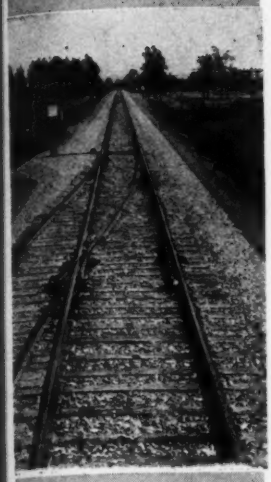
Mankind has often been astonished by the engineering ability and efficiency displayed by the beaver. With unerring skill the little animal fells trees exactly where he needs them for his dams and lodges. Performance is insured by efficiency. Fairmont engineering skill and efficiency, developed through years of specialization, produce the Performance on the job that counts in the railway maintenance field.

Fairmont Railway Motors, Inc., Fairmont, Minnesota **Fairmont**

Extra large tray space for tools and bulky material is provided for in the Fairmont 59 Series C Inspection Car. Light enough for one man to handle, it fits the needs of signal maintainers and telegraph men. Many performance advantages of this car are listed in Bulletin 359—send for it today.

Performance ON THE JOB COUNTS

OF ALL THE CARS IN SERVICE TODAY . . . MORE THAN HALF ARE FAIRMONTS



Railway Engineering and Maintenance

NAME REGISTERED U. S. PATENT OFFICE

AUGUST, 1946

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RACOR
New Forged
"MF" vertical front rods

Eliminate switch throw resistance and strain

This rugged integrally forged front rod extension is now equipped with Super Oilite Bearings, Hardened Steel Bushings and Pins. Now the inevitable flexing and distortion in conventional or bolted front rod assemblies can be eliminated.

When installed with Vertical Type "M" No. 1, No. 2 and other back rods, switch operation is made easier and more economical. Switch maintenance is also reduced.

This sturdy combination of Vertical Switch Rods completely resists the rolling of points and assures positive point position at all times.

RACOR
TRADE MARK REGISTERED

AMERICAN Brake Shoe COMPANY

Pioneers in the development and manufacture of

DEPTH HARDENED CROSSINGS	SAMSON SWITCH POINTS
AUTOMATIC SWITCH STANDS	VERTICAL SWITCH RODS
MANGANESE STEEL	REVERSIBLE MANGANESE
GUARD RAIL	STEEL CROSSINGS

World's most complete line of Track Specialties

RAMAPO AJAX DIVISION

AMERICAN BRAKE SHOE COMPANY
332 So. Michigan Avenue, Chicago 4, Illinois

Railway Engineering and Maintenance

The Big Problem—

How to Offset Higher Wages and Material Costs

The forthcoming annual conventions of the Roadmasters' Association and the American Railway Bridge and Building Association, with the concurrent joint exhibit of materials and equipment by the Track Supply and B. & B. Supply Men's Associations, in Chicago, September 17-19, present an opportunity to supervisory officers in the maintenance of way and structures departments of the railways—and to the railways themselves—the importance of which should not be overlooked.

Within recent months a number of things have happened in the railroad industry that are certain to have an important influence upon the ability of the railroads to maintain their position as profitable private enterprise for months to come. As such, these things will have an important bearing upon the lives of many in the maintenance of way and structures departments—adversely if not offset with effective counter measures.

Among the events referred to, two of the more important are the recent increase in wages granted employees, and the increasing cost of practically everything the railways buy. Regardless of the fact that the roads have been granted a small temporary increase in freight rates to help offset these increased costs, and will, no doubt, be granted supplemental increases in rates as absolutely necessary, this can only be a partial answer and, in the minds of many who fear an unfavorable reaction toward the railways in anywhere near compensatory increases, a dubious one. The only fully effective answer to increased wages and material prices, without the danger of alienating present and prospective customers, is for the railways to reduce the cost of producing their product—transportation. In this, the maintenance of way and structures departments, which annually during the last five years have spent an average of about one billion dollars to carry out their work, must play an important part; it is up to them, in common with all other using departments, through improved materials and equipment and new methods and organizations, to go beyond the economies that have been effected in recent years, and to develop new means of producing still higher standards of work at lower unit costs.

No attempt will be made here to suggest how maintenance officers can and must contribute to a substantial reduction in way and structures costs. It is our purpose merely to draw attention to the fact that this problem is of such magnitude and complexity that it will require the best thinking on the part of every maintenance officer, from chief engineer to track foreman, to find the ways and means to accomplish the results desired. Only by the acquisition of the most advanced knowledge of the manner in which new materials, equipment and methods developed during the war years can be used to improve maintenance methods, and only by the dissemination of that knowledge to maintenance officers over the country, can the hoped-for results be achieved.

Herein lies the point of mentioning at the outset of these comments the forthcoming conventions of the Roadmasters' and Bridge and Building Associations, and the accompanying exhibit of track, bridge, building and water service materials and equipment. In these activities, re-established after necessary curtailment during the war years, lies one of the most favorable opportunities afforded maintenance officers for drawing out and disseminating the facts that alone can put their operations on a sounder and more economical basis. Once again, through the many technical reports and addresses to be presented, roadway and structures officers down through the ranks will hear the best thinking of scores of their fellow officers, often developed only after months of study and experiment, and once again they

will be able to sit down together and discuss face to face their many problems—including the all-important problem of reducing costs.

Maintenance officers of all ranks, on their own initiative, should avail themselves of the opportunity afforded by the September meetings to discover ways to improve methods and reduce costs, and many of them will. In fact, both of the associations in question were built and have been sustained over these many years in large part by men who have shown such initiative.

At the same time, with the railways themselves the chief benefactors, railway managements and department heads should give their supervisory officers every encouragement to attend these meetings, with adequate time off and the assurance that their expenses will be paid. This will require enlightened thinking on some roads, but the time has come for such thinking. If the railways want those who have been entrusted with administrative and supervisory positions to put forth that extra personal interest and effort that alone can result in the greatest achievements in improved methods and reduced costs, they should not only encourage that extra effort, but should be willing to pay for it.

Preparing Surfaces—

One Important Phase of Repainting

DESPITE the shortage of paint, good brushes and qualified painters, a considerable amount of building repainting will be done this year and probably more will be done next year. This brings up the question of preparing wood surfaces for repainting. An adequate job of cleaning off the old paint is an essential to the life of the new paint as well as to its appearance. This is particularly true of those buildings that have not been painted for 15 or 16 years, as is the case with a vast number of those on the railways at present. In many instances the preparation for painting will include the sanding of weathered surfaces to expose clean, sound wood to the paint.

A paint gang was observed recently to demonstrate most of the things that should not be done on a repainting job, and few of these that should be done. After certain repairs had been made, the new wood surfaces were given a slovenly primer coat with inferior paint, by the carpenters who made the repairs. Several months later the paint gang arrived with a consignment of fish-oil paint. The only cleaning of the old surface was done with putty knives by each painter individually, immediately before he applied the paint.

The surfaces were dirty, the building had not been repainted in 16 years, but, before that, paint had been applied time after time without removal of previous coats. Some of the resin from the yellow pine lumber had exuded and raised the old paint in places, but these spots were ignored and the painting went on without interruption. Upon inquiry, the foreman stated that he intended to apply a second coat of linseed-oil paint to insure against early failure of the paint surface—as if that would overcome or compensate for all of the shortcomings in the methods being employed.

This is an extreme example of lack of appreciation on the part of the foreman of the value of thorough workmanship. Either he did not know how to do a workmanlike job or he was indifferent. In either event, there was lax and grossly inferior supervision on the part of one or more of his superior officers.

Emphasis—

Should Be Placed on Cost Where Possible

IN carrying out the multitudinous operations involved in discharging their responsibilities maintenance officers are frequently confronted with the neccessity of making decisions regarding the relative emphasis to be placed on speed and cost. Frequently, such as when bridges must be restored following washouts, there is no alternative but to undertake the work with all possible dispatch, relegating the cost factor to a secondary position. When the cost of doing such work is balanced against the need for getting trains moving as quickly as possible, it is immediately seen to be by far the least important of the two considerations.

There are other types of projects where it is frequently assumed that haste is the most important consideration, with the result that the cost of doing the work is usually higher than if the operation were carried out over a longer period of time. Consider turntable renewal projects as an example. Such projects are usually planned on the premise that the paramount consideration is to do the work in such a manner that the turntable will be out of service a minimum of time and often necessarily so. The result is that the employees engaged on such projects are frequently worked considerable amounts of overtime, and that consequently the cost is affected proportionately.

It is becoming increasingly apparent as time goes by that the need is imperative for keeping expenses under control at all times. With this in mind maintenance men may find it worth while to take stock of certain of their practices and policies with the thought that a switch in emphasis from speed to cost may be found possible and desirable on certain jobs. Here again turntable-renewal projects can be used as an example. Obviously, at the more important and congested engine terminals it will probably always be desirable to expedite turntable renewal jobs as much as possible to minimize interference with the movement and servicing of locomotives.

But at points of lesser importance, where a wye track is available for turning locomotives, or where some other arrangement can be made for handling power, should consideration not be given to the feasibility of planning the work to minimize the cost by avoiding overtime and other inefficient practices that might be found necessary if speed were considered of primary importance. Obviously, such a plan would require the turntable to be out of service for a longer period than otherwise, and for that reason might have to be "sold" to the mechanical and operating departments, although this should not be difficult in view of the economies to be realized.

Right—The Nine-Foot Tie Is Standard for Use in Main Line Track on the A.C.L. Below—Spiking Newly-Installed Ties With the Aid of a Pneumatic Tie Nipper

In this paper, which was presented at the meeting of the Railway Tie Association, in Cincinnati, Ohio, on July 15 and 16, Mr. Jeffords gives a brief résumé of the studies that have been made to determine the benefits of the 9-ft. crosstie, compared with ties 8 ft. 6 in. long. He then proceeds to show the advantages of the longer tie as they have been determined through careful study of their performance over a period of five years. His conclusion is that the 9-ft. tie is greatly superior to the 8-ft. 6-in. tie.

Are Nine-Foot Ties Worth While?

By L. S. JEFFORDS
Chief Engineer
Atlantic Coast Line
Wilmington, N. C.

IN THE early days of railroading when labor was inexpensive, it was generally conceded to be more economical and more expedient to maintain track by increased labor and intensified smoothing programs than to apply materials essential to obtaining a more permanent way. Gradually, increased weight of equipment, and demand for increased speeds made mandatory a stronger track structure on a more permanent base. Over the years rail sections increased; rail joints, tie plates and other fastenings were made heavier and stronger; crushed-stone ballast replaced gravel, sand and clinkers; the roadbed was widened, cuts were set back and drainage improved; but the one item undergoing the least change was the highly important crosstie. This was indeed strange when we consider that crosstie costs represent by far the largest single item of expense in track maintenance.

Investigation by the Committee on Ties of the American Railway Engineering Association, in 1905, revealed that the predominant size of the ties in use on most roads was 6 in. by 8 in. by 8 ft. The retention of such a size was evidently the outgrowth of precedent, and acceptance of commercial lumber sizes (two ties could be made from standard 16-ft. stock), rather than from calculations based on necessary strength and load-transferring properties. When consideration is given to gage, wheel loads, and transfer of rail pressure to the ballast, it becomes immediately evident that the 8-ft. tie is too short to meet present requirements.

By 1924, continued studies by the A.R.E.A. indicated that most of the heavy-traffic lines had increased size of their ties to 7 in. by 9 in. by 8 ft. 6 in. Of the 97 roads reporting at that time, only two had made any use of the 9-ft. ties, and those to a limited extent. Combining conclusions of the Committee on Stresses in Track with its own developments, the Tie committee concluded that 9-ft. ties were economical and highly desirable for stable track on heavy-traffic lines. In 1941 this committee recommended:

(a) The adoption of 9-ft. ties as rapidly as practical and economical.

(b) The use of 9-ft. ties, at least for heavy-traffic lines.

(c) The adoption of the 9-ft. length whenever a change is made from the 8-ft. length. These proposals were adopted and

incorporated in the A.R.E.A. Manual in 1942.

In the meantime the Atchison, Topeka & Santa Fe, in 1939, and the Atlantic Coast Line, in 1941, had adopted the 9-ft. tie as standard for their main lines.

When the center section of a crosstie rests firmly on compacted ballast and transfers rail pressures equally with the remainder of the bearing area of the tie, a condition soon develops, commonly known as center-bound track, which results in poor riding and distortion of line and surface of the rails. This condition is avoided by leaving a section at the center of the track untamped. With shorter ties, to balance inner and outer support of the rail, the untamped center section is greater than with longer ones. A 6-in. increase in the length of ties used adds 12 in. available supporting length to be tamped, as the same amount of supporting area can be added on the inside as on the outside of the rail for balanced support.

For these reasons, where center-bound track is an eventual certainty with the 8-ft. crosstie, it is not nearly so likely to occur with the 9-ft. tie, which provides 2 ft. additional available tamping length for balanced support of the rail. It is also true that 9-ft. crossties, well tamped, give more resistance to the forces that tend to distort the line and surface of the track than the shorter ones are able to offer. These qualities result in reduced labor, less maintenance effort, and operating economies in favor of the longer tie. They also result in smoother riding at high speeds.

There has been some objection to the change to a longer tie because of the irregular line of the tie ends that will result for several years. However, it has been our standard practice to maintain a ballast section three inches beyond the ends of the ties to obtain bearing support as nearly as possible to the end of the tie and to increase resistance to the lateral forces acting on the track. This wider section tends to make irregularities of tie length less noticeable than in a narrower ballast shoulder. Even where ends are exposed to view, the advantages of the 9-ft. tie are too great to withhold its adoption because of any unsightly appearance during the transition period.

Obviously, a few slight cost increases arise from the adoption of the 9-ft. tie. However, as its adoption becomes more general these increased costs will diminish. Almost invariably, a tree that will produce 8-ft. 6-in. ties, will produce an equal number of 9-ft. ties. Standard 40-ft. box cars and gondolas will hold as many 9-ft. ties as those of the 8-ft. 6-in. length. There may be some loss of production at treating plants, where treatment cylinders were constructed for shorter ties. Again, the longer tie will absorb additional preservative in proportion to its increased cubic content.

During the Last Two Years Tie Renewals on the Atlantic Coast Line Have Been Made at the Rate of 1,750,000 a Year

It costs no more to handle and place the 9-ft. tie in track, however, than is expended for the shorter one. The economy comes after installation, in reduced maintenance labor and better riding track, with resultant salutary effect on equipment and traffic.

The management of the Atlantic Coast Line, sensing the demands of the post-war period, has undertaken to rehabilitate its property and, more particularly, its track structure. It has been making tie renewals for the last two years at the approximate rate of 1,750,000 per year. As this is the only road in our territory buying the 9-ft. tie, we have been unable to purchase our entire needs in that length. Present receipts are running around 60 per cent long ties. We are allocating these to our main track and using the shorter ties for renewals on secondary lines.

Decision to adopt the 9-ft. tie was made only after considerable study by our engineering staff and careful consideration by President Davis. Our experience and observation during the five years since we began this use have convinced us that it is an important step in railway progress. We will be glad when other roads adopt this length. When this is done, I am certain that some of the present production worries of the Railway Tie Association will be considerably lightened.

With the ever-increasing demands for smoother riding and higher speeds, it is incumbent upon all roads to leave nothing undone in the way of scientific research, adoption of new and improved methods of maintenance and operation, and use of most modern designs in the way of rail and accessories, crossties, ballast and signaling and its accompanying safety devices.

Qualities of a Supervisor*

1. CURIOSITY of a cat.
2. TENACITY of a bulldog.
3. DETERMINATION of a taxi driver.
4. DIPLOMACY of a wayward husband.
5. PATIENCE of a self-sacrificing wife.
6. ENTHUSIASM of a Jitterbug.
7. GOOD HUMOR of an idiot.
8. SIMPLICITY of a jackass.
9. ASSURANCE of a college boy.
10. TIRELESS ENERGY of a bill collector.

*From the notebook of a retired supervisor of track, G. W. Burney, Savannah, Ga.—Central of Georgia Magazine, April, 1946.

This View of the Chemung River Bridge, Taken Shortly After the Washout Occurred, Shows What Was Left of the Center and Westerly Spans.

Photos Courtesy Erie Railroad

High-Water Troubles on the Erie

LATE in May the Erie, in common with a number of other eastern railroads, sustained considerable damage to several bridges along its main line in southwestern New York State as a result of flooded streams following rains of cloudburst proportions. Probably the most serious situation on this road was encountered at Bridge 286.84 over the Chemung river, near Corning, N.Y. This was a double-track, three-span, through-truss, pin-connected structure on concrete abutments and piers. High water that rose to the base of rail caused the undermining of the westerly pier, with the result that the westerly and central spans of the structure dropped into the river. The abutments and the easterly pier were not affected and the easterly span remained in place but was damaged severely.

While its trains detoured over the tracks of another railroad, the Erie built a temporary pile trestle to replace the two spans that were washed out. The damaged easterly span was repaired for temporary use by driving pile bents under it to support the lower chords and the floor system, after which those parts of the trusses above the lower chords were removed.

Right—Driving the Temporary Trestle to Replace the Wash-out Spans. Right Below—Another View of the Reconstruction Work. Shown Discussing the Job Are I. H. Schram (left), Chief Engineer of the Erie, and A. A. Visintainer, Assistant Engineer of Structures. Below—Some Conception of the Forces Exerted Is Given By This View Showing How the Pin of One of the End Posts Was Torn Free From the Connection Plates

Maintaining a

Above—A Four-Unit Diesel Locomotive Gives a Passenger Train a "Lift" Over the Heavy Mountain Grade Territory. Right—One of the Mountain Section Gangs Spotting in Ties

"ALL aboard, Train No. 5 for Easton, Martin, Stampede, Lester, East Auburn and Seattle." It is the Northern Pacific's daylight train westbound from Spokane, leaving Yakima, Wash., at 1:35 p.m. for its run over the Cascade mountains, dropping down into Seattle at 7:10 p.m. In these 5 hr. and 35 min., this train will traverse one of the most interesting, scenic, picturesque and, at the same time, the first, railroad mountain crossings of the Northwest, winding almost constantly through canyons and high rolling mountains on a continuously ascending grade to the summit, and through a two-mile tunnel at Stampede; then descending the west slope, skirting ridge after ridge between towering peaks and deep gorges, to Lester, and thence gently down the Green river grade to Auburn, the end of the district, 139 miles across the mountains from Yakima, and only 22 miles from Seattle and 18 miles from Tacoma, both great ports of the West.

Personal Observations

Resulting from a ride with the roadmaster in charge of this 139 miles of single and double-track line over the mountains, the following recounts personal observations and the answers to numerous questions concerning physical conditions and the many problems encountered by the operating and the roadway maintenance forces, winter and summer, in this territory. It is a story of difficult railroading due to curvature, steep grades, rigorous winter conditions, a short working season and heavy traffic.

From Yakima, at Elev. 1,075, the line, largely single track, ascends an undulating, generally upward grade, varying from level to 0.5 per cent, first through open, heavy-rolling country for approximately 10 miles. From this point the line extends for 22 miles through the Yakima canyon to Thrall, Wash., continuing its climb upward on grades reaching 0.6 per cent, and for the most part hemmed in by a mountain wall on one side and the winding, tumbling Yakima river on the other.

The next 45 miles westward, except for short canyon sections, belies the general condition behind and ahead, being a 70 m.p.h. territory through rolling prairie country, with only a small amount of grade exceeding 0.5 per cent and curves generally below 5 deg., except in the canyon sections. In the canyon sections, conditions are a repetition of those found in Yakima canyon, where curves call for speed restrictions.

At the end of this 45-mile stretch west of Thrall, however, the real section of mountain railroad begins with the start of a continuous 2.2 per cent (compensated) climb to the summit at Stampede, a rise of approximately 600 ft. in a distance of 6 miles. Double track all the way up the hill, this piece of line is almost a continuous succession of curves, doubling back on itself several times along the sides of peaks and ridges to gain altitude in the upward climb. In this stretch of 6 miles alone there are a total of 29 curves, mostly between 5 and 10 deg.

Down the West Slope

Approaching the summit, the line heads into the two-mile, single-track Stampede tunnel beneath the divide, reaching the actual summit 4,834 ft. from the east portal, where the grade breaks downward at a rate of 2.2 per cent (compensated) for nearly 10 miles, almost into Lester, the roadmaster's headquarters. Down the west slope conditions are largely a repetition of those on the east slope—peaks, ridges and crags, some bearing snow most of the year, far above deep wooded valleys and gorges, strikingly colored in contrast with the deep green of the nearby forests and the blue-black, mist-shrouded or cloudcapped hills in the distance. Down the west slope, again double track all the way into Lester, there are a total of 28 curves, spiraled and super-elevated for the restricted speeds in effect. Up the hill on both sides, freight train speeds generally do not exceed 10 m.p.h., while downgrade in both directions they are limited to 20 m.p.h.

a Mountain Railroad

This is a story of railroading over the Cascade mountains on the Northern Pacific, based upon the observations of the editor and the answers to many questions relating to physical conditions, train operation, and, more particularly, the responsibilities and problems of the track forces. It is a story of railroading on one of the most picturesque pieces of track in the country, and may be of special interest to the "prairie" roadmaster or trackman, because of the contrast with his problems.

Passenger train speeds, on the other hand, are restricted to 30 m.p.h. both uphill and downhill.

Beyond the end of the 2.2 per cent grade at Lester, the line continues downward on lighter gradients and curvature, first through a generally rolling country, and then through more canyons similar to those on the lower east slope—this time following the general course of the Green river—and then out into heavy rolling country, downward into East Auburn, a total distance of 42 miles from Lester. Within this distance, except as restricted by curves, train speeds are permissible up to 70 m.p.h.

Diesel Train Operation

Train operation over the Cascades, heavier during the last few years than at any previous time in history, is necessarily a part of this story, both because of the remarkable improvements that have been made in operation since the coming of nine Diesels to this mountain territory during the summer of 1944, and because of the influence of this new type of power and more intensive operation on the maintenance of the roadbed and track structure.

Prior to the delivery of the Diesels, the Northern Pacific operated two types of steam locomotives in this territory—Mallet-type locomotives of the 2-8-8-2 type, and 2-8-2 Mikado-type locomotives. In normal westbound service, a 3,600-ton freight train out of Yakima was handled by a Mallet. At Easton, near the foot of the 2.2 per cent grade, two Mallet pushers are added, which continued with the train all the way up to the summit at the Stampede tunnel. Down the west slope the retainers were set up and the train rolled down slowly into Lester. In the opposite direction the operation was practically the same, with one Mikado helper from Auburn to Lester, and two Mallet pushers from Lester to the summit.

Today, freight train operation over the Cascades is entirely by Diesels, all 5,400 hp., four-unit locomotives, six of which operate in through service between Yakima and Auburn, and the other three exclusively in helper service up the 2.2 per cent grade on each side of the pass, between Easton and Lester.

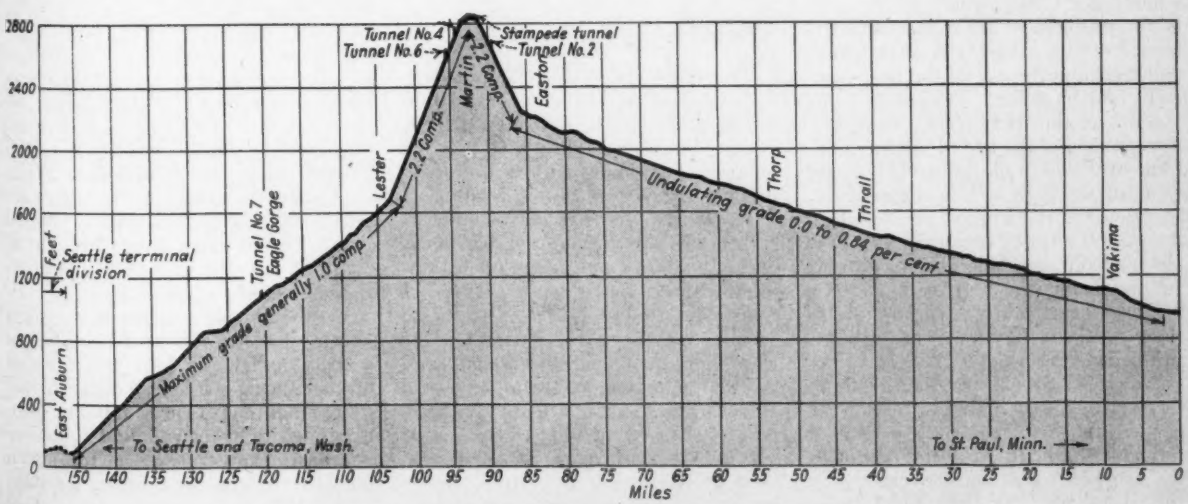
With the Diesels, 4500-ton trains are pulled westward out of Yakima with a single locomotive as far as Easton. Here, instead of the two former Mallet pushers, one additional Diesel locomotive is cut into the center of the train, and on it goes up the grade and down the other side, to be cut out at Lester. Eastbound Diesel operation is comparable, a single locomotive pulling 4500-ton trains up as far as Lester, where one additional Diesel is cut into the center of the train for movement over the hill and down into Easton.

In passenger train service, normally by steam power, the Diesel helpers are also used as required over the mountain in both directions, but generally only when trains consist of more than six cars. Formerly, with more than six cars, these trains took on a Mikado pusher from Easton westward to Stampede, and the same helper service from Lester eastward to Martin.

Operating Advantages

Through the Dieselizing of this territory, the road is experiencing a number of operating advantages, as already indicated. More specifically, however, besides reducing helper service, it has cut the average time of freight trains between Yakima and Auburn by about four hours, and has improved materially the schedules of passenger trains.

In addition, and of importance to the track forces, operation of the Diesels to date indicates that, without counterbalancing, and with their relatively short wheel base, they are considerably easier on the track than the steam power they replace. Furthermore, and a matter of no small consequence, the use of the Diesels has greatly reduced track maintenance problems within the two-mile Stam-



Condensed Profile of the Northern Pacific's Crossing Over the Cascades in Washington

pede tunnel, particularly in eliminating the problem of smoke, gas and condensation, to the point where corrosion, serious before, has almost ceased to be a factor.

Track Standards

Track standards over the Northern Pacific's Cascade crossing may be said to be in a state of flux as regards rail, rail joints and ballast. Earlier standards, still in evidence over most of the line, include 100 and 130-lb. rail, 4-hole, head-contact joint bars, single-shoulder tie plates and processed gravel ballast. Present standards, already in effect on 45 miles of line, and being extended progressively, call for 131-lb. rail, double-shoulder tie plates, and a full section of crushed rock ballast —a ballast rock being quarried at two points on this division of the railroad. Latest changes in track standards also call for 6-hole head-free joint bars and for the lagging of all tie plates to the ties with two screw spikes.

Ties throughout the mountain territory are 7-in. by 9-in. by 8-ft. 6-in.—all hard wood on curves, and soft wood elsewhere—and all pre-adzed and bored, and treated with a creosote-petroleum mixture. Cut spikes are used throughout, with double spiking on the insides of both rails on curves of 3 deg. or more.

In the Stampede tunnel, the rail, of 131-lb. section, is continuous throughout ,with Thermit-welded joints, this rail having been welded and laid in 1940. Combined with the reduced gases and condensation since the inauguration of Diesel operation, this type of construction has materially improved track conditions within the tunnel.

Curve Lubrication

Curvature on the mountain, as elsewhere on the road where heavy, adds to the problem of track maintenance, both from the standpoint of rail wear and mechanical wear of the ties, especially plate cutting. Due to the low speed over the short section of mountain grade and the use of engine sand, wear of the low rail, rather than flange wear of the high rail, is the controlling factor in rail life on curves. Thus, the rail on most of the heavy curves is changed out one side at a time, new rail replacing the high rail, and the high rail being transposed laterally to the low side of the curve—the released rail being scrapped.

Down off the 2.2 per cent grade in the territories of higher speeds, wear of the high rail has always presented the more difficult problem, although this trouble is now being overcome by the installation of rail and flange lubricators, a total of 38 of which, of the Meco and Racor types, having been installed on both sides of the mountain in recent years. These units, maintained to a high standard to insure their effective operation, are bringing about a marked reduction in the rate of rail abrasion and of wheel and locomotive tire flange wear, and are also reducing curve resistance. Regaging is not a serious problem anywhere on the mountain, this being attributed to the control of rail wear, to the use of hard wood ties on all curves, and to the practice of double-spiking.

Winter Problems Severe

Some of the special problems on the mountains—not unusual in themselves, but more aggravated than elsewhere—include the accumulation of sand and front-end cinders in the tracks, which must be disposed of periodically; protection against flood flows in the mountain streams; heavy snow conditions over the summit, each side of Stampede tunnel; and constant precautions against forest fires, which are a matter of serious concern throughout the summer season.

Over the divide, from Easton to Lester, the annual snowfall ranges from a few feet to a maximum of 20 ft., individual storms having been known to pile up snow at a rate of 1 ft. an hour. To cope with these conditions, the road maintains three rotary snow plows on the mountain and also impresses into service several spreaders, as required, which are used as dozer plows. It also keeps on call several hundred extra-gang workers from the Seattle-Tacoma area, where track work continues the year around, who can be shifted to snow-fighting service on a few hours' notice to supplement the regular track maintenance forces on the mountain.

Serious Fire Hazards

This line traverses two national forest preserves and other valuable timber land, and in the dry months there is present the hazard of fire and the necessity for taking all precautions to prevent the setting and spreading of fires. During the fire season, motor-car patrols are maintained constantly on both sides of the mountain searching for fires, and during periods of unusually low humidity and rainfall, section crews patrol behind every train, both passenger and freight, and whether operated by steam or Diesel power. Stack sparks are obviously the greatest hazard, in spite of the use of several types of spark arresters, but even the possibility of sparks from a hot, sticking brake shoe are not overlooked; hence the equally regular patrol behind every Diesel train.

All fire patrols are equipped with long-handle shovels, grub hoes, double-bitted axes and five-gallon water containers fitted with a hand pump and a short section of hose—all of this equipment being maintained intact at the various section tool houses.

Supplementing this equipment, the road maintains a special water car fitted with a 10,000-gal. wood tank and 1200 ft. of 2-in fire hose, which is further augmented by a special cache of fire-fighting tools maintained in a locked compartment at Lester. This latter equipment, which is sufficient for a crew of about 20 men, includes all of the usual fire-fighting tools, together with another 1200 ft. of 2-in. fire hose, and a portable fire pump for use where water can be secured from adjacent or nearby streams.

Still other responsibilities on the long list of duties of the track forces include the constant cleaning of cuts and strengthening of fills; guarding against slides and rock falls, supplementing the protection afforded by many installations of rock and slide detector fences; and the plowing of many miles of fire guards, wherever ground conditions make this possible. Most of the fireguard work is done by tractor-drawn gang plows or tractors fitted with bulldozer attachments—in either case a strip of ground at least 8 ft. wide being plowed.

Gang Organizations

The track forces on the roadmaster's territory between Yakima and Auburn include 2 track supervisors, 16 section crews, a couple of yard gangs, and 2 or 3 extra gangs, as required, for out-of-face program work or unusual emergencies. Normally, each section crew, including a foreman and six men, maintains about 11 miles of single-track main line or about six miles of double track. During the winter there is generally some adjustment of these forces; the crews on the ends of the district being reduced as necessary to give the mountain crews a total of 8 to 10 men each to cope with snow conditions. When necessary, the crews on the slopes are further augmented, as already pointed out, by large extra gangs brought in from off the district to help fight particularly heavy snow storms.

Of the normal summer extra gangs on the district, one of 20 to 25 men usually assists in spot tie renewals and surfacing while two others, of 55 to 65 men each, carry out any programmed rail renewals and follow-up reballasting operations. Two such gangs were employed during the sum-

(Continued on page 841)

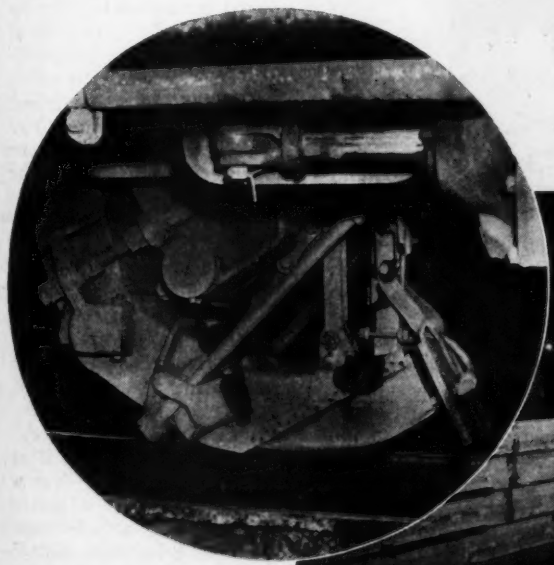
Watering Engines at 80 m.p.h.

SINCE the New York Central installed its first track water pan at Montrose, N.Y., in June, 1870, great strides have been made in the design and construction of such pans and of the scoops by means of which the water is picked up from them and transferred to the tenders of moving locomotives. These advances are reflected in the increased speeds with which locomotives can take on water. In years past it was necessary for them to slow down to about 35 miles per hour to pick up water from track pans, but the improved installations of today permit tenders to be refilled at speeds up to 80 m.p.h.

Whereas track pans were formerly of riveted construction, they are now fabricated by welding on the N.Y.C., consisting of ⅜-in. wrought iron plates welded to 8-inch channels to form pans 19 in. wide and 8 in. deep. Sections of the pans are assembled in a fabricating shop and are then transported to the site of the water station where they are welded together to form a pan of the desired length.

Locomotives that are designed for picking up water from pans are each provided with a scoop located on the tender, which is lowered by means of air pressure controlled through valves located in the engine cab. Tests have indicated that, at a speed of 80 m.p.h., 2½ gal. of water are transferred to the tender per lineal foot of scooping distance, so that in 2,000 ft. of scooping distance some 5,000 gal. of water are delivered to the tender.

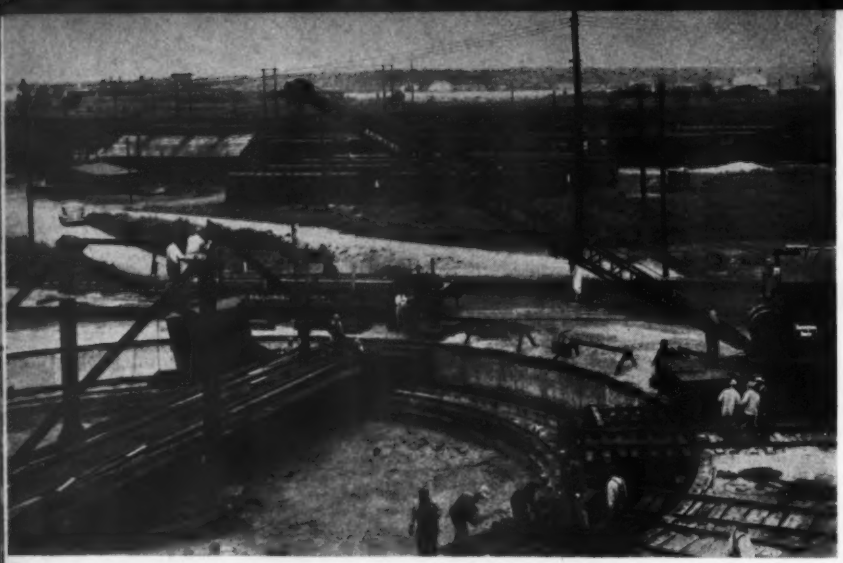
This Locomotive Is Picking Up Water from a Track Pan. Improved Design and Technique Now Make It Possible to Take On 5,000 Gal. of Water in Less Than 20 Sec. While the Locomotive Is Traveling at 80 M.P.H.



Above—Close-Up of a High-Speed Water Scoop on a Locomotive Tender. To Take on Water the Scoop Is Lowered Into the Water Pan by a Compressed Air Control Located in the Cab

Right—Interior of Shop Where Track Water Pans Are Fabricated in Sections by Welding

Burlington



The A-Frames of the Old Turntable, in Which the Rivets in the Principal Connections Had Previously Been Replaced with Fitting-Up Bolts, Were Removed with the Aid of a Locomotive Crane

After the A-frames Had Been Removed the Old Turntable Was Lined Up with the New One and, as Shown in this View, the Track for the Roller Dollies Was Extended Across It. Note Cribbing Under Old Table

IN renewing turntables the Chicago, Burlington & Quincy is now using a procedure that it feels is producing considerable savings in time and effort compared with the methods it has used formerly. Briefly, the new scheme involves the use of the old turntable as falsework on which the new turntable is supported as it is pulled into place, after which the old structure is removed and the new one jacked down into final position. To date the new procedure has been used in two instances with highly satisfactory results, the latest being the renewal of the turntable at the company's Murray Yard enginehouse at North Kansas City, Mo.

Formerly the general practice on the Burlington when renewing turntables was to jack up the old structure a sufficient distance to clear the top of the circle wall and to insert falsework for supporting it in that position. Next, a suitable runway was built continuously beneath the old turntable and the table was mounted on roller dollies to permit it to be pulled to a position in the clear of the pit, using a crane for this purpose. The next stop was to shift the cribbing of the runway in the pit, as necessary, to place it in line with the new turntable, which had previously been assembled to one side of the pit, supported on roller dollies and a runway. The runway of the new table was then extended across the pit on the cribbing, after which the new turntable was pulled into place and jacked down to final position.

The idea was conceived on the Burlington that considerable waste motion could be eliminated, as already indicated, by using the old turntable as falsework for the new one. It was felt that this method would save considerable time and labor, largely because the old turntable would take the place of the cribbing that would otherwise have to be installed first under the old structure and then shifted to a new position to support the new turntable.

An Example

A conception of how the new procedure is applied in practice is afforded by the recent renewal of the turntable at North Kansas City. The engine terminal at this point embodies a seven-stall enginehouse with three approach tracks to the turntable. Originally the turntable was 75 ft. long, but some years ago it was replaced with an 80-ft. turntable, and in connection with that work a precast concrete slab, 28½ in. thick, was inserted on top of the center pier.

As it existed immediately prior to the recent project, the turntable at North Kansas City was a balanced-type through-truss structure in which each truss consisted of an A-frame with a vertical post at the center. The operator's cab and the tractor were mounted together at one end of the table on a side extension of structural members. The circle wall was of reinforced concrete.

The turntable installed in place of the old 80-ft. table is a second-hand structure, 100 ft. long, that was installed originally in 1927 at Galesburg, Ill., but removed from that point in September, 1945. As built originally it was a twin-span, three-point-bearing turntable of the deck-girder type, but after its removal at Galesburg it was converted into a continuous-type table with a three-point bearing. It has a solid-type treated-timber deck 8 in. thick, except for a short distance at each end where steel ties, in the form of H-section beams, are used.

Preparatory Work

In preparation for changing out the old turntable a new circle wall was constructed of reinforced concrete, supported on creosoted pine piles. Also, the new circle rail was

Devises Better Scheme for Renewing Turntables

Economies in the installation of turntables on the Chicago, Burlington & Quincy, are being realized through the use of a procedure in which the turntable being removed is used as falsework to support the new structure during installation. Details of the new method, as applied to the renewal of a turntable at North Kansas City, Mo., are given in this article.

placed, which is of 131-lb. rail, with electric-welded joints, supported on 14-in. by 15-in. by 1⅜-in. steel plates, to which it is fastened by clips having adjustable eccentric washers. A feature of the circle wall is that it incorporates a capacious room, with a removable wood cover, for use when inspecting the running gear of the turntable tractors.

In connection with the construction of the new circle wall, one of the approach tracks and the seven enginehouse tracks, between the old and new walls, were placed on timber falsework. Also, the backwall of the old circle wall was removed and, in preparation for dismantling the remainder of this wall by blasting, a line of holes 3 ft. deep was drilled in the concrete at 3-ft. intervals.

To speed the work of dismantling the superstructure of the old turntable during the actual change-out operations, all rivets were removed from the principal connections and replaced as necessary by fitting-up bolts. As another preliminary step the new turntable was assembled in a position adjacent to the turntable pit, supported on a series of 10 roller dollies operating on a track radially from the old turntable center, consisting of two double lines of scrap rails, one under each girder. Five of the dollies, each incorporating a nest of three rollers, were equally spaced under each girder.

The Procedure

On the day that the actual work of changing out the turntable was undertaken the old turntable was lined up with the runway under the new structure, after which the first major step was the removal of the old table superstructure, above the deck level, this being necessary because the old truss member afforded insufficient clearance for the collector frame of the new turntable. The members of the A-frames were removed with the help of a locomotive crane operating on one of the enginehouse tracks. Meanwhile, the supporting members of the old operator's cab and tractor were severed and this part of the structure was lifted out of the pit as a unit.

When the work of removing the superstructure of the old turntable had been completed the runway under the new turntable was extended across the existing structure on a level grade. This was done by laying falsework timbers on the rails of the old turntable to serve as ties for the two lines of double rails comprising the runway for the new table.

To minimize resistance against movement of the new turntable in the event that the roller retainers came into contact with the sides of the runway rails, grease was applied to the outer sides of the heads of each double rail, but none was applied to the running surfaces of these rails because it was thought that it would cause difficulty by piling up ahead of

The New Turntable Being Moved to Position Over the Old One, the Pull Being Exerted by a Locomotive Crane Which Is Not Shown in this View

The New Turntable Has Been Pulled Into Final Position Over the Old Structure Which Will Now Be Removed to Permit the New Table To Be Jacked Down Onto the New Circle Rail

the rollers. To support the old turntable while the new structure was being pulled into position, a timber crib was inserted under it on each side of the center pier, midway to the circle wall.

When all preparations had been completed, a locomotive crane was spotted on a track directly across the turntable pit from the new turntable, and the pulling cable, which had been wound directly on the drum of the crane, was carried across the old structure and attached to the near end of the new turntable. When the pull of the crane proved insufficient to overcome the initial resistance of the roller dollies it was augmented by the power of a number of pneumatic jacks placed in an inclined position against the far end of the new turntable. When movement was once started the crane was able to pull the structure into position over the old turntable without further difficulty.

The next step was to build timber jacking cribs under the ends of the new turntable, supporting them on the new circle wall. Then, with the aid of jacks supported on these cribs, the new turntable was raised sufficiently to take the load off the old structure. The supporting cribs under the old turntable were then removed and this structure was rotated through an angle of 90 deg. It was then divided into two halves by cutting it apart between the two center cross-girders, after which the two halves were removed individually by a locomotive crane.

Center Pier Remodeled

With the old turntable out of the way work could proceed on the remodeling of the center pier, which had to be lowered somewhat to accommodate the bearing for the new table. To do this the precast portion of the old pier, which, as mentioned previously, was 28½ in. in depth, was removed, after which the pier foundation was leveled up as necessary with the aid of a "rust" joint to receive the steel bearing plates for the new structure. In taking out the old precast concrete cap, steel wedges were used to loosen it from the underlying concrete, after which a cable was placed around the cap and it was pulled into the clear by a crane.

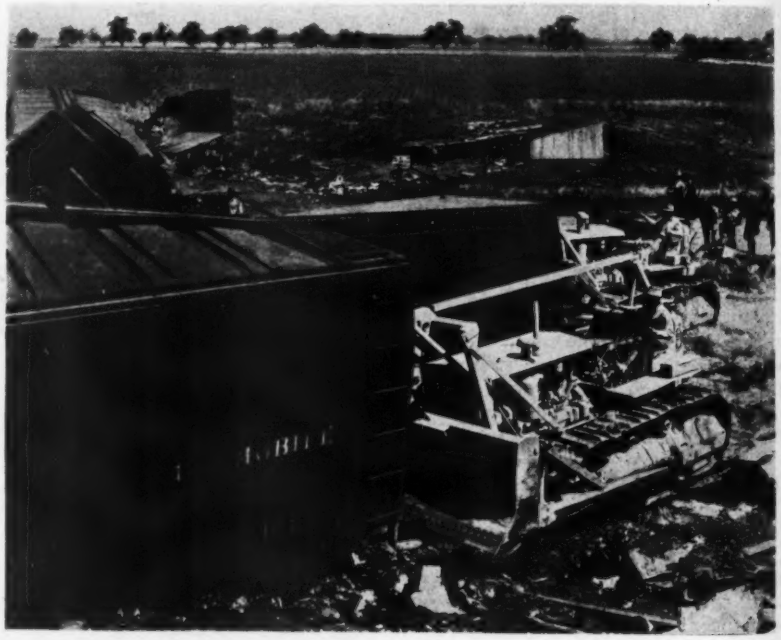
With the work on the center pier completed, that of jacking down the new turntable could be undertaken. In preparation for this, two blocking cribs were installed under the turntable, one at approximately each midpoint between the center pier and the circle wall. The work of lowering the structure was accomplished with the aid of four 100-ton air-driven jacks, two at each end, which were supported on the jacking cribs previously constructed. In the jacking operation the ends of the turntable were lowered alternately in increments of 8 in., so that as one end was being lowered a portion of the load was carried by the blocking crib near the opposite end.

Meanwhile the old circle wall was demolished by blasting short sections of it at a time. In this work mats were used to cover the sections being blasted to prevent the loosened material from flying about. A clamshell was used to remove the debris of the old circle wall. As one of the final steps a 6-in. concrete floor with premolded bituminous expansion joints was applied to the bottom of the pit.

Fabreeka Pads Used

A feature of the new turntable is that, in common with a number of other turntables on the Burlington, Fabreeka rubber fabric pads were installed under the ends of the rails on the turntable and under the ends of the approach rails where they bear on steel rim-beams incorporated in the top of the circle wall. The purpose of the pads is to cushion the impacts caused by moving locomotives and thereby to minimize their effect on the rails and on the end members of the turntable. The use of these pads at turntables on the Burlington, which is still in the experimental stage, will be described in detail in an early issue of *Railway Engineering and Maintenance*.

The work of installing the new turntable at North Kansas City was carried out under the general supervision of H. R. Clarke, chief engineer of the Burlington, and F. H. Cramer, bridge engineer. The field work was under the direct supervision of R. E. Sheehan, supervisor of bridges of the system, P. E. Littles, master carpenter of the St. Joseph and Kansas City Terminal divisions, and H. O. Burkland, assistant engineer, acting as turntable inspector. The work was done by company forces, except the blasting of the old circle wall, which was performed under contract.



Speeds Wreckage Removal with Caterpillar Tractors

Following a derailment recently on a western railroad, involving 21 cars of a 95-car freight train, the work of clearing the track and right of way was materially expedited by the use of a fleet of five Caterpillar tractors with bulldozers. The wreck occurred when a truck driver, blinded by the sun, drove his vehicle onto the track at a grade crossing in the path of the train. Derailed by the impact, the locomotive uprooted more than 100 yd. of track and then turned over on its side, followed by the 21 cars which were strewn about or jammed together over a distance of 450 ft. To help in clearing the track the railroad obtained five D8 Caterpillar tractors from local contractors and ranchers and put them to work removing the wreckage, uprighting cars and rebuilding the roadbed. An officer of the railroad estimated that the use of the tractors made it possible to clear the track in one-third the time that would otherwise have been required. This view shows how the tractors were used to maneuver the damaged cars into the clear.

Inadequate Protection Blamed in Death of Foreman

A TRACK foreman was killed in a recent head-end collision between a track motor car and a freight train on the Central Vermont, which could have been avoided if adequate protection had been provided for the movement of the motor car, according to the report of the investigation of the accident issued by the Interstate Commerce Commission.

The accident occurred about 7:10 a.m., April 20, 1946, on the single-track line extending between White River Junction, Vt., and St. Albans, 117.23 miles, at a point 12.49 miles north of White River Junction and 1,799 ft. south of the station at Sharon. In this territory, trains are operated by timetable and train orders and no block signal system is in use. The maximum speed of freight trains is restricted to 45 m.p.h. and that of motor cars to 25 m.p.h.

Approaching the point of the accident from the south, there are in succession, a 3-deg. curve to the right, 1,198 ft. in length, a 90-ft. tangent, and a 3-deg. 15-min. curve to the left, which extends 1,552 ft. to the point of accident and for 3,496 ft. beyond.

The Maintenance of Way Rules and Instructions issued by the road require that the persons in charge of the operation of motor cars must carry a copy of the current operating timetable and that these persons clearly instruct all others riding on the motor cars as to the part each will take in emergency.

Morning Line-Ups Broadcast

A special bulletin, published by the railroad on April 20, 1940, requires the train dispatchers to broadcast at 7:00 a. m., daily except Sundays, a line-up of all trains on the road, using the dispatcher's telephone for this purpose, and operators on duty at open offices are required to record the line-up and repeat it. Section foremen at points where no operator is on duty are directed to listen in on the broadcast, but are instructed to refrain from repeating or acknowledging the line-up, and, in fact, are instructed not to communicate directly with the dispatchers except in emergencies. Foremen who fail to obtain the line-up are directed by this bulletin to communicate with the nearest operator by commercial telephone.

According to the Commission's report, the dispatcher broadcast the morning line-up at 7:01 a.m. on the day of the accident, and entered it in the train order book. The line-up included the information that Extra 460 North had departed from White River Junction at 6 a.m. The surviving members of the section gang reported that the foreman was seen listening to the dispatcher's telephone in the station at Sharon about 7 a.m. and that shortly thereafter he ordered them to place the motor car on the track. He did not inform any of the gang as to the train movements in the vicinity, although he had done so on some occasions in the past. The motor car was placed on the track at 7:08 a.m. and was moving southward at a rate of about 10 m.p.h. about two minutes later, when the trackman assigned to keep a lookout ahead saw Extra 460 North about 500 ft. distant. He promptly warned the foreman who applied the brakes and stopped the motor car. The gang then attempted to move the car off the track, but before this could be accomplished, it was struck by the train. The foreman was killed.

Extra 460 North left White River Junction at 6 a.m. and performed switching service at West Hartford, 5.21 miles south of the point of accident, from which it departed at 7 a.m. Because of the track curvature in the vicinity and a high embankment on the inside of the curve, the view at the point of accident was restricted to about 500 ft. in each direction.

In the investigation it was developed that no train order had been issued restricting Extra 460 North from proceeding at maximum authorized speed. The brakes of this train had been tested prior to the accident, and functioned properly when an emergency application was made when the motor car was first seen about 500 ft. distant. The dispatcher stated that he had no knowledge of what understanding the section foreman involved may have had of the line-up, since the foremen are not required to repeat the line-up nor are they required to inform the dispatcher of the fact that they are listening to the telephone broadcast.

The Commission concluded that this accident was caused by the failure of the railroad to provide adequate protection for the movement of a track motor car and recommended that the Central Vermont take steps to provide adequate train-order or block-signal protection for the movement of track motor cars in the future. The report further stated that an order to show cause why it should not do so will be served on this carrier.

Maintaining a Mountain Railroad

(Continued from page 836)

mer of 1945, one in the relaying of 39 curves with approximately 70,700 lin. ft. of rail, and the other in the re-ballasting of approximately 10 miles of track with crushed rock.

The two track supervisors on the district act essentially as motorized track inspectors, each being assigned from 65 to 68 miles of territory, which he is expected to cover daily, except Sundays, on the one-man inspection car with which he is equipped. Aside from making a routine inspection of track conditions over his entire territory daily, each supervisor is expected to inspect all switches and to give at least one mile of track a detailed inspection on foot.

Two other men of importance on the district are motorized rail lubricator maintainers. Each of these men, equipped with a one-man inspection motor car and the necessary tools, devotes his entire time to the cleaning, refilling, maintenance and repair of the lubricators, one operating in the lubricator territory east of the mountain grade and the other in the lubricator territory beyond the west slope of the mountain.

In line with the road's expanding program of mechanizing its track forces, practically all heavy operations on the district are carried out with power tools and machines, including a complete complement of rail-laying equipment; two power tie saws to facilitate tie renewals; and, for ballasting and surfacing, a power track jack, a power ballaster, a number of electric and pneumatic tie tamping units, and portable electric lighting outfits, as required, for use while working in tunnels. All section and extra gangs are equipped with track motor cars and trailers.

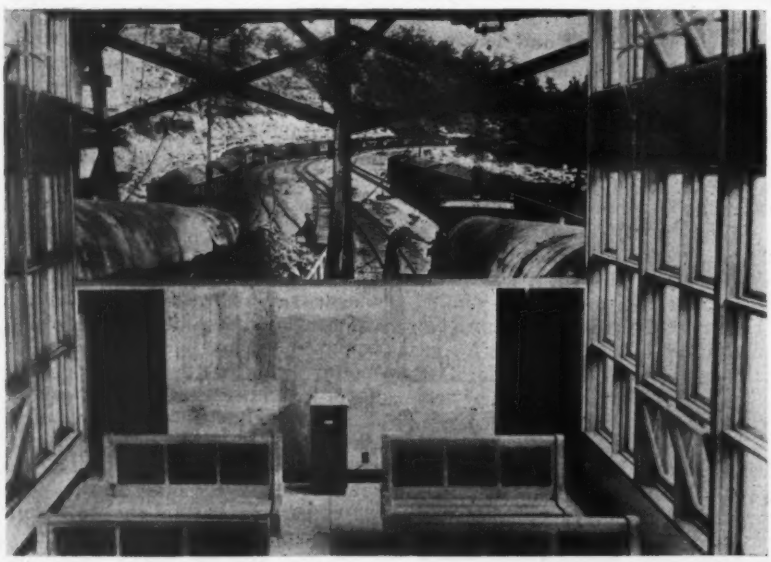
These are some of the responsibilities of the division superintendent, C. H. Burgess, at Tacoma, and his roadmaster, J. O. Devies, located at Lester, which is a central location for his work.

Small Station Has Ra and Other In

The Chesapeake & Ohio recently completed the construction of a modern passenger station at Prince, W. Va., that is functional in character but, architecturally and otherwise, in sharp contrast with the conventional. The new facility incorporates several new features in its treatment and equipment, outstanding among which is radiant heating, a system in which the heating elements are entirely concealed in the floors and ceilings, and designed to produce cleanliness, a uniform temperature and body comfort.

ON its main line at Prince, in the heart of a highly productive bituminous-coal territory in West Virginia, the Chesapeake & Ohio has recently completed a passenger station that introduces a number of innovations, such as solar orientation, radiant heating, and ultra-violet lamps in its lavatories as a protection against bacteria, which may well have an important bearing on this road's future station construction. Architecturally, the structure deliberately avoids exterior ornamentation for stylistic values of more enduring popular appeal, employing instead a simple pleasing treatment that will be in harmony with the streamlined passenger trains that are expected to be put in service next year on the scenic main-line route of the C. & O. between Washington, D. C., and Cincinnati, Ohio, with scheduled stops at Prince. It also incorporates fire-resistant construction, a train announcing system that is extended out on the platform, fluorescent lighting fixtures, and interior appointments and daylighting which insure the utmost convenience and comfort for the traveling public.

Rectilinear in plan and elevation, the station is 125 ft. long and 22 ft. wide, is one-story high, and has exterior walls of common brick faced with a reddish face brick. Sills and trim are of gray Indiana limestone, while the roof is a flat reinforced concrete slab, 4 in. thick, with projecting eaves, overlaid with 2 in. of Foamglass insulation and covered with tar-and-gravel roofing. The building throughout rests on a concrete foundation, and is not provided with a basement.



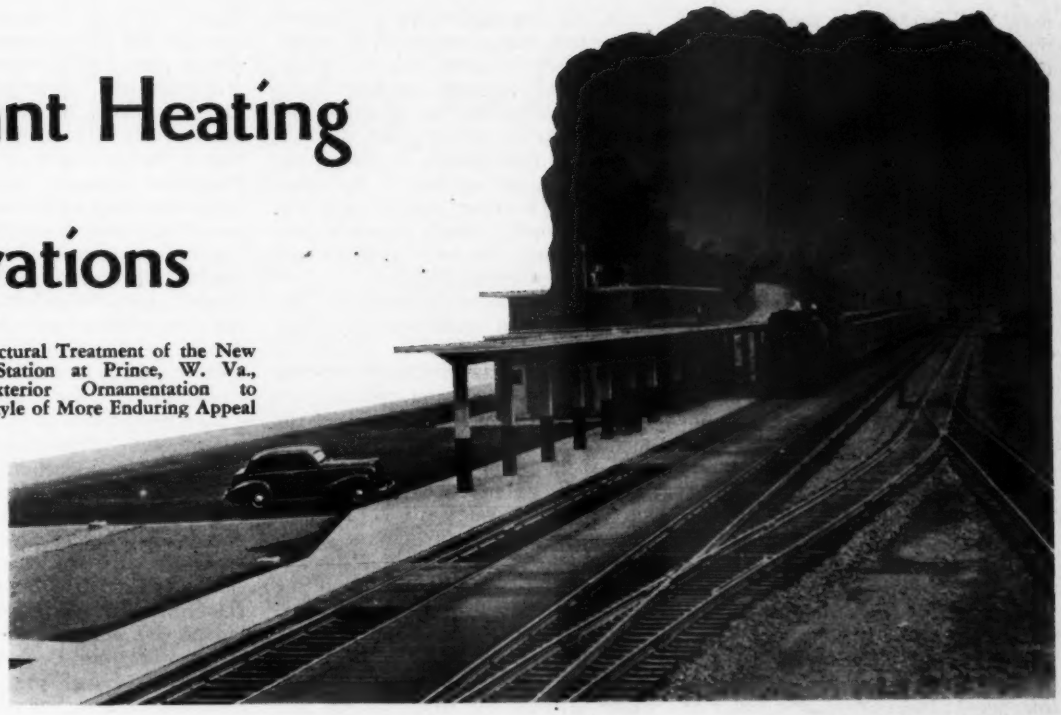
Flanking the front of the station on its track side is a reinforced concrete, low-level platform, 500 ft. long, which is afforded protection over a part of its length by a reinforced concrete canopy of streamlined design, which harmonizes with the new building. Behind the station is a paved parking lot for patrons that will accommodate 38 automobiles.

Waiting Room Is Attractive

The waiting room, which occupies the center of the station, is 55 ft. by 20 ft., with toilet rooms, a ladies lounge and a utility room at one end, and a freight, baggage and express room, 35 ft. by 20 ft., at the other end. The front and rear faces of the waiting room incorporate large panels of plate glass extending virtually from

Above—Supplementing the Large Window Panels in the Waiting Room Side Walls, a Photo-Mural of a Typical Coal-Mining Scene on One End Wall Increases the Effect of Spaciousness. Right—Showing the Pipe Floor Coils Before They Were Embedded in Sand and Covered with Concrete and Terrazzo

Radiant Heating Innovations



The Architectural Treatment of the New C. & O. Station at Prince, W. Va., Avoids Exterior Ornamentation to Achieve a Style of More Enduring Appeal

the floor to the ceiling, which give an air of cheerfulness and spaciousness and, in addition, because of the station's location in the scenic New River valley in the Appalachian foothills, serve as picture windows as well as assure an abundance of daylighting.

The floor surface of the waiting room is of terrazzo laid out in sections, with the C. & O. emblem "Chessie" inlaid in the center of the room. The wall areas framing the windows and at the ends are faced with Colorado Travertine, and a large photo-mural, depicting a scene typical of the coal-mining industry and illuminated by specially arranged recessed lighting, decorates one end wall. The ceiling is 17 ft. above the floor and is composed of sound-absorbing material, as will be pointed out in more detail later.

The floors in the toilet rooms and the ladies lounge are of ceramic tile and the walls are of structural glass. The plumbing features and other appointments are equally modern, with a special feature the installation of ultra-violet ray lamps in each toilet room as an aid in promoting sanitary conditions. The freight, baggage and express room at the opposite end of the station has a concrete floor and glazed tile walls, and is adequately equipped with facilities appropriate to the functions to be carried out there, including a storage room for mail and valuables.

Solar orientation was included in the building design to take advantage of the warming rays of the sun in the winter, and yet shade the interior in hot weather. The platform canopy is located on the south side of the station and shades the lower part of the large panel-type window area on that side. However, since the canopy roof is not as high as the building roof, it does not shade the top of the window area. This horizontal band of glass above the canopy is afforded shade in the summer by the overhang of the projecting roof of the station, the amount of overhang having been computed with reference to the meridional position of the sun to shield this window area from the high summer sun, but to expose it to the lower sun rays in the winter.

The Radiant Heating Coils Installed Overhead Are Concealed Between the Ceiling and the Roof

Radiant Heating

The radiant heating system in the Prince depot sets a precedent in station heating by being the first of its kind employed in a railroad passenger station. In the system installed, hot water is circulated by pumps, from a boiler fired by screw-type, bin-fed coal stoker in the utility room, through a series of pipe coils located within the

floor, and also between the ceiling and the roof. More specifically, the system is laid out in two zones, one serving the upper and lower levels of the waiting room and the toilet rooms, and the other the freight, baggage and express room. Two independent wall thermostats, one in the waiting room and the other in the baggage room, control the different zones, permitting different temperatures to be maintained in the two areas in the interest of economy, since the baggage room does not require the same comfort conditions as the waiting room. Furthermore, heating coils were placed only above the ceiling in the baggage room so as not to introduce any unnatural temperatures in the floor which might affect baggage, mail and express stored there.

In the design of the installation, a boiler water temperature of 135 deg. F. was selected and is maintained at that level by means of an aquastat wired to the stoker. The hotter supply lines were installed near the outside walls where the heat losses will naturally be higher, while the return lines were placed nearer the center of the room where the heat losses will be lower. The design contemplates a drop of 20 deg. F. in the floor system from supply to return at the boiler, and a corresponding drop of 10 deg. F. in the ceiling system, while the mean water temperature was planned for 125 deg. F. in the floor coils and 130 deg. F. in the ceiling coils. The room air temperature in each zone is maintained at a predetermined level by means of water temperature regulation through the action of a thermostatic-controlled three-way valve.

Coil Arrangement

The arrangement of the piping above the ceiling is clearly pictured in the accompanying illustration. Ceiling coils throughout are of 1¼-in. Byers wrought iron pipe, on 12-in. centers, suspended from metal hangers supported by the ceiling joists. The specification of an acoustical ceiling of the insulating-board type presented a problem to the heating engineers, because materials of this kind would result in some inefficiency of the ceiling coils. This problem was overcome by changing the acoustical ceiling to the combination perforated steel and insulating-board type, with the two layers separated to provide space between them for the heating coils. This procedure placed the thermal insulation above the coils, rather than beneath them, avoiding the otherwise interference with the downward radiation of the heat, while at the same time augmenting the 2-in. layer of Foamglass roof insulation.

In the baggage room a plastered metal lath ceiling was used, no acoustical treatment being required there. This permitted a normal installation procedure wherein the pipe coils are strapped to the ceiling joists, with the metal lath tied directly to the piping, and the plaster applied in the usual manner. However, special care was taken to work as much plaster as possible through the lath openings and around the heating coils.

The floor coils, formed of 1-in. Byers wrought iron pipe on 18-in. centers, are embedded in 1¼ in. of sand on the 4-in. reinforced concrete floor slab, and the sand and pipe are covered with concrete, topped by the terrazzo flooring surface. No insulation of any kind was used under the floor coils or concrete base, but the top surface of the concrete was protected by a water-proofing membrane, and a ½-in. strip of water-proofed insulating material was placed around the perimeter of the floor slab to minimize edgewise heat losses to the outside walls and footings.

No variation in pipe diameters was made between the supply mains and the coils in either the floor or ceiling systems and all pipe connections were made by welding.

The air in the public rooms of the station is kept clean by several expedients. Because radiant heat passes through the air without agitating it, drafts caused by convection currents are minimized, permitting dust particles in the air to settle instead of swirl around the room. Air circulation in the waiting room, therefore, is dependent primarily upon the opening and closing of the exterior doors in normal station operations, but it can be supplemented, as desired, by the use of manually-controlled ventilating sashes built into the high and the low panels of the windows. Fan-driven ventilators are installed in the toilet rooms to assure satisfactory air circulation in these areas.

The new station at Prince was built from designs prepared by C. & O. architects in collaboration with Messrs. Garfield, Harris, Robinson and Schafer, architects, of Cleveland, Ohio. The actual planning and direct supervision of the work were carried out by Alexander C. Robinson, III, consulting architect, and E. C. Hoyer, Jr., engineer of buildings of the C. & O. John P. Pettyjohn & Co., contractors, Lynchburg, Va., handled the construction. The radiant heating system was designed by John Paul Jones, of Cary & Millar, consulting engineers, Cleveland, and was installed by T. Johnson, heating contractors, Huntington, W. Va.

Keg Lifting Device Promotes Safety

For some time the Atlantic Coast Line has been using a safety device for lifting kegs, which was developed by L. F. Duvall, system supervisor of reclamation. With the old method of handling kegs of spikes or bolts by hand, hands or fingers of the workmen were likely to be injured. The new device is used in a manner similar to a pair of rail tongs. The kegs are gripped near the bottom by semi-circular arms of steel with inside caulks, and are lifted in an upright position by two men. The device not only eliminates the causes of injury but also enables kegs to be handled easily and quickly.

Tests Point Way in Battle Against Termites

This article* describes the extensive field tests conducted under the auspices of the A.R.E.A. at Florissant, Mo., to determine the relative protection afforded against termite attack by a number of soil poisons, and also by various types of treatments for wood

Part of a Structural Beam of Yellow Pine Completely Destroyed by Termites

IN March, 1939, a subcommittee of the American Railway Engineering Association installed an extensive test at Florissant, Mo., to determine the relative protection against termite attack given by a number of soil poisons, and also by various types of preservation and other treatments for wood. This test was a sequel to a similar test of 22 soil poisons in the same locality, begun in May, 1932, and completed in April, 1937. In the first series of tests, only one compound, trichor-benzene, was 100 per cent effective as a soil poison in guarding against termite attack. Because this is a rather expensive material, the committee decided to initiate a second series of soil poison tests, which would include other possible soil poisons not included in the first test, and which would also include a number of posts dipped in various solutions and other posts impregnated by pressure. The latter tests were established on May 11, 1939.

Selection of Chemicals

Chemicals were selected which experience had shown gave promise of successful prevention of termite attack and some compounds were tested about which little or nothing was known. They were included because the promoters made definite claims and representations regarding them to railway companies. In each case the recommendations of the company as to how to use its product were followed. This will explain why, in some tests, only pressure impregnated posts were included; in others, pressure, dipping, and soil poison; and, in still others, only soil poison, or some other means of protection.

The test included 344 two-by-fours, two feet long, each of southern pine, except sets treated with copper naphthanate, which included some Douglas fir and ponderosa pine. In all tests, untreated control pieces were included, cut from the same pieces of wood used for treatment. All posts were provided with embossed copper labels before driving, which included the test number, treatment symbol, post number, and location number in the row. With the system of labeling used, the inspection of posts could in no way be biased, because none of the inspecting party could tell what the individual posts were, what chemical was used, or whether the posts had been dipped, pressure treated or processed otherwise.

A large tract of land was cleaned for the test in a locality where the soil consisted of a rich loam with a high humus content, and where termites were known to be very active. The plot was laid out in seven rows, four feet apart, marked A to G, and the posts were driven two feet apart in each row. All posts were driven into the ground so that only six inches showed above the ground line. After the driving, those which were to be protected by soil poisons had the respective solutions promptly poured around them.

Dates Installed

While most of the posts were driven on May 11, 1939, several tests were started at later dates. Specifically: Isco—posts driven April 20, 1940: Larvacide—posts driven April 20, 1940; and Copper naphthanate—posts driven April 17, 1940. Arrangements are now in progress for additional tests of a number of compounds not hitherto included in the 1939 or 1940 installation.

The whole plot was left without any care, and weeds, blackberry bushes, etc., grew over it. No attempt was made to clear away vegetation until October 25, 1944, when the whole area was cleared in order to make inspection of the posts possible. It is now proposed to leave the plot alone again until such time as another inspection is planned.

In the first tests at Florissant, posts with the same treatment were driven consecutively in a row. Objection was made, and properly so, that this was not a proper test because termites might not be present at all points in a plot of ground. It was suggested, therefore, that the posts be scattered over the entire tract and far enough apart to prevent the results on any post being influenced by compounds used at adjacent posts. Accordingly, each post was located by a drawing, in the manner of a lottery, insuring that there was no preference in favor of any piece in the field, which resulted in a fair distribution of each series of posts over the area. After the completion of the work, a large chart was prepared showing the positions of all of the posts in the test field.

Untreated Stakes Driven

To determine whether termites are actually working in the test plot, a considerable number of untreated pine stakes was driven at random over the field, to be pulled from time to time for examination. Incidentally, the presence of termites in the area was

*Abstract of a report prepared by a subcommittee of the Committee on Wood Preservation of the American Railway Engineering Association, of which Herman von Schrenk, consulting timber engineer, St. Louis, Mo., was chairman.

indicated clearly by the condition of pieces of wood, stakes, etc., which had been lying on the ground in the vicinity for some time.

Solutions Tested

The following is a list of the compounds and methods of application finally used in the tests:

Pinola—soaked and poured*. *Trichlorbenzene*—100 per cent—poured*; 80 per cent trichlorbenzene—20 per cent kerosene—poured*; 50 per cent trichlorbenzene—50 per cent kerosene—poured*; 25 per cent trichlorbenzene—70 per cent kerosene—poured*; 50 per cent trichlorbenzene—50 per cent kerosene—poured*; 500 cc. of 10 per cent trichlorbenzene—90 per cent petroleum—poured**; 2000 cc. of 5 per cent trichlorbenzene—90 per cent petroleum—poured**; 500 cc. of 5 per cent trichlorbenzene—95 per cent petroleum—poured*; and 2,000 cc. of 10 per cent trichlorbenzene—90 per cent petroleum—poured**. *Coal-Tar creosote and kerosene*—50 per cent of each—poured*. *Antimite*—4 per cent solution—poured*. *Wolman Tanalith U*—4 per cent solution—poured*. *Zinc Chloride*—3.48 per cent solution—pressure-treated to refusal. *Pentachlorophenol (Permatol A)*—5 per cent solution in fuel oil—pressure-treated; 5 per cent solution in fuel oil—dipped; and 5 per cent solution in fuel oil—poured*. *Hooker Solvent T*—poured*. *Scafoil*—Two brush coats, and soaked 6 hr. *Sharples No. 36 Mixture*—poured* and dipped. *Celcure-Sol*—pressure-treated, dipped and open tank process. *Chromated Zinc Chloride*—pressure treated—1.03 lb. per cu. ft. *Alpha Nitronaphthalene*—poured*. *Phenyl Mercury Oleate*—pressure treated—0.098 lb. per cu. ft., and pressure-treated—0.190 lb. per cu. ft. *Ascu*—pressure-treated—0.25 lb. per cu. ft., pressure-treated—0.50 lb. per cu. ft. *Wolman Salts—Tanalith U*—pressure-treated. *Larvacide (Chloropicrin)*—poured*. *Isco Insecticide Spray*—poured*. *Copper Naphthanate*—dipped and pressure-treated.

Two Examples of Attack by Termites. Above—Timber Sill From a Frame Building. Right—Foundation Pile Under a Coal Trestle.

*Poured into V-shaped trenches around the posts, 2 in. wide at the ground line and 3 in. deep.
**Poured in a circle of 20 in. diameter around the posts.

Inspection

The posts were inspected November 2, 1944, after they had been in the ground approximately 5½ years. Each post was pulled and inspected and then reset and redriven at once. Three persons inspected each post, a fourth read the labels and a fifth recorded the inspection results, which were tabulated along with details concerning the composition of the soil poison used or the wood treatment employed. Another examination will be made again after some years, and all posts will be allowed to remain on the test tract except those completely destroyed by termites or decay.

Discussion

Emphasis is placed upon the fact that all tests involve only a small number of posts (6 to 12 in any one test). This should, of course, be remembered when the results are studied, and it should be realized that ultimate life records would require many more individual posts. It is believed, however, that the results to date clearly indicate possible trends in protection. For instance, if 6 posts in one test all remain without being attacked by termites during 5½ years, that may indicate that the compound, combined with the method of treatment used, is probably a fair risk and that one might venture to use such process and chemical with some assurance of increasing the life of wood in contact with the ground. The reverse can, of course, be true for chemicals in combination with the treatment, which fail to protect the posts 100 per cent. If wood is not protected entirely against termite attack, then it certainly cannot be considered as a material to be used on a large scale.

In every test, each set of treated posts had a similar number of untreated posts, called controls, cut from the same two-by-fours as the treated posts. These untreated posts, which were also driven in locations selected by lot all over the test area, were, with very few exceptions, completely destroyed by termites and decay so that they failed and, in many cases, fell over. The termite attack, judging by the appearance of the posts, probably took place soon after the posts were driven. The extra pieces of pine driven here and there were examined at frequent intervals and were found to have been attacked during the first year in all cases. The universal termite attack at all points in the test area shows that it was an excellent place for the test.

Conclusions

An analysis of the failures shows that chemicals applied as soil poisons are not as effective as the same chemicals when applied by the pressure or open-tank methods.

The chemical compounds and methods of their application to the posts which to date have entirely prevented attack by termites, as well as decay, were:

Copper Naphthanate applied by pressure
Celcure applied by open tank (equivalent to pressure)
Ascu applied by pressure
Pentachlorophenol applied by pressure
Trichlorbenzene applied by pouring on the ground around the posts
Hooker Solvent T. applied by pouring on the ground around the posts

Whether many of the chemical compounds applied as soil poisons would have protected the posts if such compounds had been forced into the wood by pressure is something which the committee did not investigate and which, accordingly, it cannot discuss. The principal reason why the committee did not carry out many tests with posts treated by pressure is that it decided at the outset to follow the recommendations of the manufacturers advocating their products for termite control, which, with few exceptions, said, "Use our product as a soil poison."

What's the ANSWER?

Track Jacks Inside the Rail

Is the use of track jacks inside the rail permissible? If so, under what conditions and with what restrictions? If not, why?

In Special Cases

By A. E. Perlman
Chief Engineer, Denver & Rio Grande Western, Denver, Colo.

The use of track jacks inside the rail is permissible under certain conditions, such as (1) through switches, near the frog, especially where long frogs of heavy rail sections are installed; (2) through tunnels that do not have sufficient side clearance to allow the jack bar (lever) room outside the rail; and (3) on bridges where there is not enough room outside the rail for men to operate the jack bar safely. In the latter case, placing the jack inside the rail should prevent men operating the jack from falling off the bridge if the jack should slip or break.

There are other places, in yards along loading tracks, where the track jack can be used to advantage inside the rail. However, wherever a track jack is used inside the rail, it must be protected by flag in accordance with the operating rules, and extreme care must be taken to prevent injury to hands by the opposite rail while working the jack bar.

Should Not Be Permitted

By G. S. Crites
Division Engineer, Baltimore & Ohio, Baltimore, Md.

The use of track jacks inside the rail should not be permitted, except where conditions are such, as in tunnels, where leverage cannot be obtained if the jacks are placed outside the rail. If there are many places where the regular design of jack has to be placed inside the rails, enough side-pumping jacks should be obtained to care for these situations. If any reasons arise to demand that regular jacks be placed inside the rail, this must be done under flag protection, just the same as would be done for any other obstruction, since a train encountering a jack placed inside the rail may be derailed.

Must Do It Sometimes

By John L. MacMillan
Track Supervisor, Alton, Springfield, Ill.

Every foreman has had to use track jacks inside the rails at some time or another. Sometimes this is necessary to get clearance for the jack bar; at others the foreman desires to sight down the outside of the rail; but in most cases it has been for the purpose of lining track, where no other way was available.

Whether placed inside or outside the rail, the same precautions must be observed; that is, the jack must be in good condition with the trip completely reliable. Furthermore, the man assigned to operate the jack must be one who can get it out of the track in the least possible time. As a rule, the jackman should have no other duties while the jack is inside the track. Again, a flagman or watchman should be assigned to warn the approach of trains that cannot be seen for at least a mile.

Because of the heavier rail sections and generally heavier construction, lining with the new small track jacks

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Send your answers to any of the questions to the What's the Answer Editor. He will welcome also any questions you wish to have discussed.

To Be Answered in October

1. *In what ways does the use of tie plates affect the life of ties? Does the area, the eccentricity or the thickness of the plates make any difference? Why? How should they be fastened?*

2. *What details should be given particular attention when making an inspection of roofing?*

3. *What is the best way to prevent settlement of embankment next to concrete abutments or the timber bulkheads of bridges? Of overcoming continued settlement in existing embankments at these points?*

4. *What is the minimum depth of ballast on which track can be maintained satisfactorily on ballast-deck bridges? In what way does this differ from ordinary track? Does the kind of ballast make any difference?*

5. *Is there any effective means of assuring uniform frost action in the ballast? If so, how can it be accomplished? Does this have any effect on the uniformity of frost action in the subgrade? If so, what? If not, why?*

6. *What are the relative merits of cast iron, wrought iron and steel for underground water lines less than 4 in. in diameter? What precautions, if any, are desirable?*

7. *Where subdrainage with cross drains has been installed in a cut, is it worth while to mark the location of the cross drains? How should this be done? What other form of record, if any, is desirable?*

8. *What can be done to minimize breakage of operating cables on sand spouts and coal chute aprons? What sizes and types of cable and sheaves are most satisfactory for each service? Why?*

has become quite a general practice. The lining of turnouts has always been done with jacks, and in this application the jack has always been used against the rail itself. Now, however, there is a new tool out for shifting track that makes the use of the track jack under the rail unnecessary. This is the track shifter which goes under the rail, while the jacks that are used with it sit well back out of the way of the rail.

Only Through Turnouts

By C. Halverson
Division Roadmaster, Great Northern, Willmar, Minn.

Track jacks should not be allowed to be placed inside the rail, except when leveling or surfacing through turnouts or ladder tracks, where their use in this manner is permissible, but it should be done under the protection provided in the rules. Track jacks should be set on either side of the frog when making a lift, to insure that the lift will be uniform, and to allow the ties supporting the frog to be tamped evenly and solidly, thus insuring a uniform bearing for the frog.

With this exception, jacks should always be placed on the outside of the rail. The footing on the outside of the track is firm and level, which facilitates the handling of the jacks. There is also less danger of train accidents when jacks are used on the outside of the rail, since they can be released quickly from the track and placed in the clear. Furthermore, as the work of leveling and surfacing track progresses, the forward movement of the men handling the jacks interferes in no way with the other workers.

In former years when the placing of track jacks inside the rail was considered permissible, this was done to facilitate the tamping of the jack ties. With the introduction of power-driven tamping equipment, which has resulted in increased efficiency in the tamping of ties, this practice has changed and is no longer considered necessary.

Vegetation Under Bridges

Is there any practical way of preventing or retarding the growth of vegetation under bridges? If so, how can this be done? If not, what measures should be taken to protect the structures against fires?

Usually Scalps Area

By F. H. Cramer
Bridge Engineer, Chicago, Burlington & Quincy, Chicago

About 80 to 90 per cent of the fires in railway trestles are caused by sparks from locomotives. The sparks fall on the deck of the structure, or on dry grass and weeds, causing them to burn, and these fires may be communicated to the trestle. Whether treated or untreated, timber is a combustible material; it becomes more so when treated with creosote, as most of our trestle materials are.

For these reasons, in addition to a reasonable amount of protection on the deck, it is important that the ground beneath and around the ends of the structures be kept clear of grass, weeds, drift and other combustible material for a distance of at least 20 ft. from the nearest timber.

Vegetation is usually cut with a shovel and removed to a safe distance where it is burned. So far as my experience and observation go, I am convinced that there is at present no other way of either preventing or retarding the growth of vegetation under timber bridges. Every high water deposits a certain amount of silt, and seeds are again planted, starting a fresh growth of vegetation which must be controlled later in the season.

Weed destroyers containing certain salts of arsenic have been used to advantage in the control of vegetation, but there is so much danger that livestock may partake of it that its use cannot be recommended. In any event, the effect of its use on the vegetation will last only until the next high water, which may be a matter of days only.

Recently a non-poisonous borax compound has been tried out under bridges and elsewhere on the right of way, with apparently good results. This compound comes in sacks, is in granular form and is scattered over the ground by means of a hand tool.

Section Forces Do Work

By Supervisor of Track

On this road it devolves upon the section forces to provide the fire protection for timber bridges, where the hazard arises from grass fires. I have spread both refined salt and rock salt in varying amounts over the area under and adjacent to such structures with good results in some cases, and almost no success in others. I have applied large and small doses of weed-destroying chemicals with almost the same indeterminate results. I have had my gangs scalp the vegetation, always with effective results, but at relatively high cost.

It must not be overlooked when using any chemical compound, whether it be salt or some commercial product, the dead grass must be removed if the fire hazard is to be removed. Green grass never burns, but dry grass, if the growth is dense, may burn fiercely. There have been many authenticated reports of prairie fires in the pioneer period which jumped the Mississippi and other rivers and continued to progress on the other side of these streams.

Creosoted timber, provided it has had ample time to season after treatment does not catch fire readily, but, once ignited, it burns fiercely until the oil has burned out. If the timber is not treated but is old it may ignite readily and burn until the structure and all of its members are destroyed. In many instances a creosoted trestle will quit burning when the creosote burns itself out, and the trestle may be scarcely impaired, whereas the untreated timber is almost invariably destroyed unless the fire can be put out.

In either event, however, it is elimination of the possibility of the structures becoming ignited that is concerned in the question, not the methods of fighting the fire after it has been started. My experience over many years leads me to believe that there is no satisfactory substitute for scalping the ground under and around timber structures.

Recommends Salt

By Wayne Anderson
Section Foreman, Illinois Central, Bargesville, Ind.

The growth of vegetation under bridges can be retarded to a certain extent by sprinkling salt on the ground early in the spring. This should be done as soon as the vegetation starts to grow. Otherwise the structure should be protected by scalping the area under and around the bridge.

Chemicals Not Effective

By T. M. von Sprecken
Chief Engineer Maintenance of Way and Structures, Southern, Charlotte, N. C.

This question has been a very active one with us, in which we are all interested, but I regret to say that, so far, we have not been able to develop

a satisfactory answer to any of the foregoing questions. There should be some practical way, however, of preventing or retarding the growth of vegetation under bridges, and we have made several test applications of chemicals, although without success.

Our practice over a period of years has been to "grass" under timber and pile trestles, removing the grass and other vegetation with shovels. The grassing line extends at least six feet beyond the base of the trestle. When vegetation is specially heavy, it is moved or cleared to a distance of 20 ft. beyond the scalped area. This is effective but expensive. It also has a tendency to undermine the blocking of frame trestles and since the material removed is thrown out alongside the trestle, the tendency is to obstruct the effective waterway. In time, this requires removal to restore the full effectiveness of the waterway.

Should Foremen Check Ties?

Should foremen be required to check ties as they are mewed to see that they comply with standards for quality and size? Why? If so, what action should they take?

Not a Good Practice

By G. S. Crites
Division Engineer, Baltimore & Ohio, Baltimore, Md.

In former years, many ties were produced in forest areas and wood lots adjoining the railway and were delivered to the nearest point on the right of way. In most cases the ties thus delivered were installed in the track without treatment, and it was considered necessary for the foreman to check them for both quality and size as they were received on his section. Since habits persist, some of this viewpoint with respect to checking ties has been inherited by the present generation of maintenance officers, particularly those who have risen through the ranks. However, in all cases, it was not a good practice, since it opened the way for collusion between the foreman and the tie producer.

At present the general practice is for the tie producers to cut ties to prescribed standards with respect to quality and size, and such ties go to the treating plant. Under this procedure the foreman is required to check the ties he receives with respect to number and grade, so that the record of the ties on his section will be correct. There should be no occasion for a foreman to criticize the standards for quality, since there are few of them competent to do so.

No Necessity for Doing So

By General Roadmaster

Under present practice ties are purchased under the specifications of the American Railway Engineering Association, which has set up rigid requirements for both quality and grade. These ties are "taken up" by experienced tie inspectors who examine them carefully for conformance to the specifications. The ties are then sent to the treating plant for seasoning, and here they are under observation by other skilled and experienced tie men. When they get to the foreman it will almost always be a waste of time for him to make a critical inspection of the quality of the ties, although, if he finds them to be generally defective or below requirements, it is his duty to so report to his superior.

On some roads a specific system for the distribution of ties to various lines and localities has been worked out with respect to the kind of wood and grade of tie to be used on each line. In the event that the foreman receives ties that are not in accordance with this schedule, he will be much at fault if he does not call attention to this fact.

Foremen now have enough responsibilities to discourage men of less sturdy character, and it seems to me that it is more or less brutal to require them to accept a responsibility that clearly belongs to some one else, particularly to one who is probably better paid than the foreman, and who is burdened with a single responsibility —the inspection of the ties. Furthermore, such an inspection will divert his attention from productive and essential work, to undertake a non-essential job.

Protecting Earth Dams

What measures can be taken to protect earth dams from muskrats and other burrowing animals? How effective are they?

Should Be Part of Design

By G. E. Martin
Superintendent Water Service, Illinois Central, Chicago

The presence of muskrats and other burrowing animals in reservoirs impounded by earth dams is a potential hazard to both the dam and the water supply which depends upon its continued integrity. Plans for the construction of a dam where burrowing animals are abundant should include means for protection against them. A concrete core wall will eliminate the possibility of serious damage from their burrowing activities. Paving the upstream face of the dam will be beneficial and, in most cases, will eliminate this source, as well as protect the earth section from erosive wave wash.

Where protection against burrowing animals was not provided during the construction of existing dams, and where trouble develops from this source, it is highly desirable to exterminate the animals. Trapping is probably the most effective means for doing this. In addition to the effort to exterminate the animals, not less than a 12-in. layer of well-placed riprap should be laid on the upstream side of the dam to a point 4 ft. below the water line. This will make it difficult for the animals to burrow.

Trees or other heavy vegetation should not be allowed on earth dams. This will make the site less attractive to these animals and at the same time will facilitate inspection to determine whether trouble from burrowing animals or other causes is developing.

Core Wall Essential

By E. M. Grime
Engineer of Water Service, Northern Pacific, St. Paul, Minn.

In the first place, a good earth dam should be provided with a core wall of timber, concrete or steel, through which animals cannot burrow. A core wall of well-compacted clay combined with about 75 per cent of gravel will also offer quite effective resistance to burrowing animals.

If the dam has already been constructed, the most effective protection against muskrats is to cover the slopes and the immediate adjacent ground

with a layer of sand or loose gravel to a depth of about 12 in. When an animal attempts to burrow into this he soon becomes discouraged by reason of the hole caving in behind him. This is a cheap method to follow at an old dam where the earth core wall may be of doubtful value or the original timber core decayed badly. If the sand or gravel fill is maintained throughout all seasons of the year, it should be quite effective.

Cindered Slopes Effective

By W. Woolsey
Section Foreman, Illinois Central, Chicago

Muskrats not only infest dams where conditions are favorable, but they do an untold amount of damage to railway embankments across swamps and where ponds or small lakes are about the fills, unless they are exterminated or placed under rigid control. In the past they have been known to honeycomb embankments to such an extent that serious wrecks have resulted where the fills collapsed under trains.

Probably the most effective method of eliminating the trouble is to face the slope, be it embankment or dam, with a heavy coating of cinders or other loose material such as sand or gravel. No burrowing animal will persist in its efforts to dig a hole in material that insists on caving in and filling the hole. It should be understood that a thin coating will not do the trick; only a heavy blanket will be effective. Cinders are the most effective of all loose materials, because they contain a rather high sulphurous content that is offensive to the animals, besides which they usually present sharp faces and corners that annoy them.

Getting Reliable Line-Ups

What measures should be taken to insure that operators of motor cars obtain line-ups of trains? How can they know that no misunderstanding exists and that the line-up is correct?

Officers Should Check

By G. M. O'Rourke
Assistant Engineer Maintenance of Way, Illinois Central, Chicago

Responsible supervisory officers, such as the division engineer, the trainmaster, the supervisors of track, bridges, buildings, water service and signals, should check the line-ups held by operators of motor cars whenever and wherever they meet them out on the line of road. In this way they can determine the correctness of the line-ups and the operator's understanding of them.

More Restrictions Needed

By Malcolm E. Condon
Track Supervisor, Erie, Campbell Hall, N. Y.

In view of the continuing serious motor-car accidents, in many cases despite the holding of line-ups by motor-car operators, it becomes apparent that more restrictive rules than those now in effect are needed, and that they be enforced strictly. Practice and experience through about a third of a century have resulted in the establishment of a group of rules, regulations and procedures, which, when followed carefully result in safe motor-car operation, even on the heaviest traffic lines.

Line-ups should be obtained from the train dispatcher, through the local telegraph operator, in the same way as trainmen receive train orders—not on train-order forms, but on a special form designed for this purpose. If it must be obtained through a field 'phone, the motor-car operator should write it down on the form and repeat it to the dispatcher, the same as the telegraph operator does with a train order.

Line-ups should be obtained for definite periods, not exceeding two hours on main lines and three hours on branches, with shorter time limits if the density of traffic or operating conditions make this desirable. This time restriction is of real importance, since it simplifies the line-up for both the operator and the dispatcher and guarantees that the operator will call for another line-up within that time, if the motor car is still occupying the track. It also gives the dispatcher an opportunity to advise the operator of changes in trains that may occur by reason of emergencies or changing traffic conditions. The dispatcher should enter all line-ups issued by him into a record book that is maintained for this purpose.

It also becomes the obligation of the motor-car operator to check at all open telegraph offices along his route where conditions make this necessary or desirable. He should make use of field telephones when it is expected that opposing or following trains are reasonably close, and the track should be cleared, particularly when the expiration time of the line-up is drawing near.

Copies of all line-ups should be sent to the supervisor's office daily, attached to the daily time sheet. They can be checked by the supervisor as to legibility, completeness and the route followed by the gang. Knowing where the gang worked, it is a simple matter to determine whether each foreman is making his motor-car movements with satisfactory line-ups. On the other hand, realizing that the line-ups are recorded by the dispatcher and checked by the supervisor, the foreman does not attempt to make unauthorized runs without line-ups.

It is only by impressing clearly and definitely on each motor-car operator the full extent and importance of his responsibility as an operator, and by insuring, through continued training and education, his complete understanding of the rules, that safe operation of motor cars will result.

Rules Are Ample

By G. S. Crites
Division Engineer, Baltimore & Ohio, Baltimore, Md.

To insure that operators of motor cars obtain line-ups of trains it is essential that rules be established and incorporated, not only in the rules and regulations of the operating department, but also in the rules and instructions governing the department or departments using the motor cars. Most roads have done this. These rules should provide that before placing a motor car on the track, the employee in charge must obtain information concerning the movement of both trains and other motor cars.

Since trains may be run in either direction on any track whenever necessary or expedient, employees operating motor cars must not pass an open telegraph office or block station, or leave a point where communication is available, without receiving information as to train movements. Because other motor cars may be authorized to operate in the same territory, information must also be given concerning such movements.

Information given to motor-car operators must be in writing, except when given over telephones when there are no telegraph operators, in which case the motor-car operator

will write the information and instructions on a prescribed form and repeat them back to the dispatcher. The dispatcher must also keep a copy of all information and instructions given. To make these rules binding, it is necessary that tests be made from time to time to ascertain whether they are being complied with in every respect.

In the event that it is not possible to get a line-up of trains as prescribed, the employee in charge of the motor car must see that its movement is given flag protection before it is set on the track and until such time as it is taken off again.

When Lining Tight Rail

What precautions should be taken when lining rail that is tight? Why? Does this differ for curves and tangents? Between lining in and lining out on curves?

Line When Cool

By H. F. Fifield
Engineer Maintenance of Way, Boston & Maine, Boston, Mass.

Track that is tight should not be disturbed during the period of the day when the heat is high, but rather the lining should be done during cool periods. Tangents may be lined at any time, provided the throw is such that it is not necessary to dig out the ends of the ties or disturb the cribs. If a curve is tight, with no expansion, it will be difficult to line the track in without cutting out a section of rail. It is usually possible to line out on the curve if the throw is limited.

Present standards of construction, including ballast, anti-creepers, double-shoulder tie plates and heavy rail, make sun kinks rare. If the rail is given the correct amount of expansion allowance when laid, this expansion can be maintained, thus curing the cause of tight rail and its hazards.

Should Be Loosened

By G. S. Crites
Division Engineer, Baltimore & Ohio, Baltimore, Md.

Rail that is tight should be loosened before the track is moved in the ballast; otherwise there is always danger that the track may jump off the roadbed when an effort is made to line it. This applies particularly to tight rail on long tangents. Furthermore, it is good practice never to disturb tight rail on curves. Although it is true that if the rail on curves does jump as a result of being tight, adjoining track can be lined out, provided clearances are not impaired, and no one may be the wiser, except the gang that did the work; it is better not to take chances. In other words, if the rail on a curve is tight, it should not be disturbed until proper expansion is provided.

Ordinarily, in lining a curve there is as much track to be thrown out as there is to be thrown in, and the outward throws should be made first. If the rail remains tight after the outward throws have been made, it will be necessary to take out some rail before the points that are to be lined are put into true alinement.

Safety Most Important

By W. Woolsey
Section Foreman, Illinois Central, Chicago

When rail becomes tight the first and most important consideration is that of safety. This is true whether the rail needs lining, whether it must be surfaced or whether it is to remain untouched. Tight rail presents a hazard at all times, but this is aggravated as the temperature rises during the summer and causes the metal to expand. Track containing tight rail is most likely to kink under a moving train, for which reason it should be given preferred attention during hot weather.

The hazard of tight rail is also increased where the ballast section is below standard. Where this situation exists a slow order should be placed over the stretch of track that is under suspicion, until some correction can be applied. When this has been done sufficient expansion should be provided to relieve the longitudinal compression in the rail. This can be done by cutting out a section of rail near the center of the tight area and driving the rail from both directions to fill the gap, or by going back to the point where the joints have pulled open as the rail has crept. If, on the other hand, the rail has sufficient expansion and the trouble is caused by frozen joints, the quickest and easiest method of correction will be to loosen the bolts and then strike the joint bars one or two sharp blows to loosen them, thus allowing the rail to expand and the ends to come together. If this does not correct the trouble fully, and it seldom does in extremely hot weather, either of the remedies that have already been mentioned should be undertaken.

What has been said up to this point applies primarily to tangents. Where the rail is tight on curves, extra precautions become necessary, particularly if the ballast section is insufficient to restrain the track from lateral movement. Obviously, track containing tight rail never "jumps its bed" toward the inside of the curve, although there may be a decided movement in this direction after the buckling has gotten well under way.

Tight rail on curves demands slow orders or, in emergencies, flagging until the slow order can be issued. It should be emphasized again that track with tight rail will buckle under trains, even when they are moving at restricted speed. Where the rail on a curve is tight and the track must be lined, the quickest and simplest way to provide relief will be to break a joint in each rail at the center of the curve, first pulling enough spikes to allow for movement of the rail. Allow the rail to rim and overlap until the compression stresses are relieved. Then line the curve in or out, or partly in and out, as required.

The overlapped rail ends at the disconnected joints will show just how much rail must be cut out to restore the continuity of the track.

Demands Caution

By John C. Rouse
Extra Gang Foreman, Southern Pacific, Crockett, Cal.

Lining rail that is tight demands extreme precautions, especially in hot weather when the compressive stresses already in the rail are augmented by those of expansion under the high temperature. If joint gaps remain as a result of frozen joints, loosen the bolts enough to allow free movement of the rail in the joint bars. If the track has been skeletonized, fill in with ballast at the ends of the ties before any attempt is made to move the track laterally or to disturb it on its bed. In the event that a considerable throw is required, as when taking out a long swing, shorter rails should be inserted to provide the needed expansion allowance.

On curves that must be lined partly in and partly out, it is better to line the sharp places in first and then follow this by lining the flat spots out. In this way the sharp places can be lined in the morning before the rail gets hot, while the flat spots will line out

more easily as the rail becomes warm.

On the other hand, if a large throw, either in or out, is required, it will be necessary to cut in shorter or longer rails, depending on the direction of the throw. If the entire curve must be thrown in or out, as sometimes happens, then it must be determined how much rail must be cut out or added to insure that the continuity of the track will not be broken when the lining is completed. If the rail is not too tight and it is at all possible to get the curve back into correct alinement without cutting a rail, this should be done, for a tight curve will generally adjust itself to the adjoining tangents. Any curve that must be moved very much should be lined ahead of the laying of new rail to assure the correct amount of expansion for the new rail.

Line in Early Morning

By Edward Wise, Jr.

Engineer Maintenance of Way, Louisville & Nashville, Louisville, Ky.

When lining rail that is tight, it is preferable to do the work early in the morning when the rail is cool. Bolts in joint bars should be loosened to permit expansion of the rail to equalize at the joints. If too many joints are frozen and the rail continues to be tight, some rail should be cut out by placing a rail in each side of the track, say a bolt-hole spacing shorter than the rails in the track, so that only one hole will need to be drilled in each rail. The rails removed from the track should be left on the ground so they can be replaced later.

This precaution should be taken for tangents and for curves that line in. If the curve is to be lined out there will be no necessity of introducing the short rails.

Rail Should Not Be Tight

By Engineer Maintenance of Way

I suppose that we will never get away fully from tight rail, although from my point of view there is little excuse for the condition envisioned by the question. We are providing heavy rail sections; are, supposedly at least, anchoring them with an adequate number of anti-creepers; and are providing double-shoulder tie plates and an adequate ballast section. When the rail is laid it is given the standard expansion allowance which long experience has shown to be ample.

Under these conditions, provided maintenance is kept to a corresponding standard, I fail to understand why rail should be allowed to become so tight that special precautions must be taken when it needs lining. I am speaking now of main-line track, not of branch lines where economic conditions do not permit a type of construction corresponding to main-line standards. As a matter of fact, it has been my observation that on many districts the branch lines give less trouble from tight rail than the main lines do.

I do not believe in the necessity for lining tight rail. Where it must be done, it indicates negligence on the part of some responsible officer. When I was a young man I was placed in charge of a main-line district that had a 0.5 gradient several miles long, all on tangent. This was about the time that anti-creepers were coming into use, but we had none on this stretch of track. I had had little experience and no one had warned me of the hazards inherent in tight rail.

One of our best passenger trains was due on this stretch of track about 11:30 a.m. The day was hot, about the middle of July, and the foreman noticed that as the temperature rose the track was becoming somewhat kinky near the bottom of the grade. He immediately put out slow flags and proceeded to line the track, hoping to complete the job before the passenger train arrived. He did not succeed, although he had done some lining and had the ends of the ties dug out to line another place, when the train came in sight.

The train was carrying a business car containing three vice-presidents, the general manager, the chief engineer, the engineer maintenance of way and other operating officers. The engineer acknowledged the slow flag with the prescribed blasts of the locomotive whistle, but did not slacken his speed, which the speed record showed to be above 75 miles an hour. The track buckled under the train, obliterated 1,200 ft. of track, gouging as much as 4 ft. into the roadbed for some distance; injured almost 100 passengers, fortunately, none of them seriously; and did about $6,000 worth of damage to the vice-president's car and twice that amount to the feelings of its occupants.

Since that time I have watched the matter of tight rail meticulously, and have never had a piece of buckled track from that day to this. The time to overcome tight track is when it begins to get tight, not when it has reached the stage of an emergency. If it hasn't enough anti-creepers, apply more. If it still moves, drive it back and add some more anchors, but never let it get into a condition where more than ordinary precautions must be taken to line the track.

Spray Painting for Buildings

To what extent is it feasible to employ spray painting for the exteriors of buildings? For interiors? What are the limitations? The advantages? The disadvantages?

Must Be Competent

By Supervisor of Buildings

In the first place, spray painting cannot be done without suitable equipment, but since so much of this equipment is available there should be no excuse for failure to provide equipment that is suitable for the particular job to be done. In the second place, the spray-gun operator must be sold on his job. Men who have been educated to paint with brushes, and there is a surprising number of painters who have never painted in any other way, are inclined to take pride in their work, in their ability to paint with a brush and in their artisanship. Many of them resent the substitution of spray painting for brush painting so much that they never become adept as spray painters. For this reason, the importance of selecting men who can be relied on is apparent.

Spray painting can be used on almost every surface to which paint is applied, and with any kind of paint. Both automobiles and box cars are painted in this manner. Steel bridges, ornamental iron work, picket fences, wood and plastic surfaces and many other structures and surfaces can be painted by this method. Among other advantages are less cost per unit of area, a high rate of application, the ability to use quick-drying paints, and the fact that only a moderate amount of training is necessary.

No Limitations

By General Inspector of Buildings

So far as I have been able to observe, there are few limitations to spray painting that do not also apply to brush painting. Some difficulty has been experienced in the spray painting of certain interiors where rooms

must be continued in service while the painting is under way, because of the almost complete atomization of the paint which allows the fine particles to be diffused in the air throughout the room.

For the same reason, when painting interiors by this method, care must be taken to eliminate the use of open flames in the room while the job is under way and to assure adequate ventilation to carry these fumes to the outer air. A well-done job of spray painting will compare favorably with the best of brush painting in both appearance and lasting qualities. A poor job by either method will always be unsightly and may have a short service life.

Considers It Better

By Engineer of Buildings

We have kept the painting of our buildings down to the minimum for about six years, partly because of lack of labor and partly under pressure from government sources to eliminate work that could be deferred. For ten years before the beginning of this period, this phase of our maintenance had been neglected sadly, principally because of lack of funds. As a result we are faced with an accumulation of deferred building painting of greater magnitude than at any time in my recollection.

While we would like to do a very large amount of this work this year, in an effort to start catching up with our needs, we have been restrained from reaching this objective in three ways—inability to buy the quality of paint we desire in the quantities desired, by lack of experienced and qualified painters, and because of the high price of good brushes.

Not a few of our older painters have retired in recent years, particularly since the end of the war, and the younger men who were in the army or went into war plants are not returning to us. We have been compelled, therefore, to take on inexperienced men. We find that these men can be trained to do spray painting during a relatively short apprenticeship. This is impossible with brush painting. For this reason we are equipping a number of our gangs of building painters with spray-painting equipment and, in these gangs, are discontinuing the use of the brush, except for special areas, such as stenciling, striping, etc., where the brush can be used to far better advantage.

Power-Driven Trench Pumps

What are the advantages of power-driven trench pumps? The disadvantages? Are the former sufficient to warrant their assignment to individual bridge and building gangs?

A Handy Tool

By J. S. Hancock
Bridge Engineer, Detroit, Toledo & Ironton, Dearborn, Mich.

We have found the two and three-inch sizes of self-priming, direct connected, gasoline-driven, centrifugal trench pumps to be among the handiest tools carried by our bridge and building gangs. They are compact and are light enough to be handled by one man. The self-priming feature is of particular advantage.

The 3-in. size, when required, will pump as much as 15,000 gal. of water an hour and will keep the water in the trench down to strainer level without losing its priming, even when necessary to pump only a few gallons of seepage an hour. It is also capable of handling water containing a large amount of mud and other solids. Anyone who has been compelled to operate the old-style, cumbersome, heavy pumps, particularly under emergency conditions, and who has had them lose their priming as a result of defective foot valves, will appreciate these modern, light-weight, self-priming pumps.

Since the engine is lubricated by placing oil in the gasoline, the quantity and type of oil should be in accordance with the recommendations of the manufacturer. The lubricating oil should be stirred into the gasoline until the mixture starts to foam before placing it in the tank, instead of attempting to mix the oil and gas by shaking them in the container, for, if the latter is done, excess carbon from the oil will plug the exhaust ports and muffler and will also foul the spark plugs. When not in use, these pumps should be primed and run for about five minutes every 30 to 45 days to keep the working parts lubricated and prevent the points from oxidizing.

From the standpoints of either emergency or light-duty service, there are no disadvantages in these light-weight pumping units, except their first cost. Because they are so convenient to handle, they are used sometimes when hand equipment, costing much less and more easily maintained, would be entirely satisfactory. On most emergency work, however, hand-pumping equipment is not adequate and a power-pump of some type must be available when needed.

Obviously, the power unit is more difficult to maintain than the hand-operated unit, although anyone familiar with the repairing of motor cars can make most of the repairs needed. However, after considerable use it is desirable to return the unit to the factory for a thorough overhauling by men expert in their manufacture.

Certainly, the advantages of these light-weight trench pumps outweigh any disadvantages and they should be considered as standard equipment for use by bridge, building and water-service gangs.

Favors Their Use

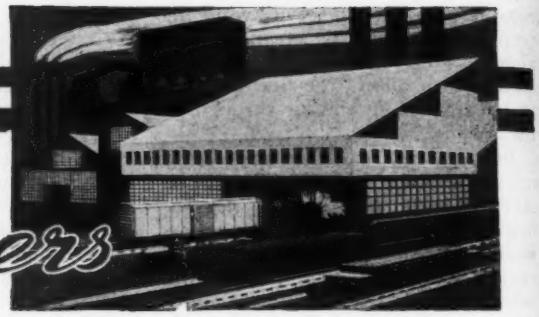
By District Engineer

Taken on the basis of pure merit alone, the power trench pump is highly advantageous where any considerable volume of water must be handled or where the work of the gang may be delayed or interfered with by seepage water. Where the volume is small and needs to be pumped only intermittently, the hand-operated trench pump is more economical from the viewpoint of over-all cost, however.

With labor as scarce and as high-priced as it is at present, almost any device that will avoid delays to the work is an advantage, provided it can be obtained and operated at reasonable cost. It must be remembered that the operation of a hand pump requires the service, intermittent or continuous, of one or two men, while the power-operated pump can be started and left unattended for long intervals.

Again, the capacity of the hand pump is limited, while power-operated pumps are available that will handle a volume of water ranging from a few gallons to as much as 15,000 or more gallons an hour, with no requirements for adjustment, and no break in the priming. There has been more or less discussion whether such pumps should be of the diaphragm or the centrifugal type. This, however, is a matter to be decided on the conditions to be overcome. It does not affect the conclusion that the power pumps have advantages that outweigh their disadvantages, and that at least one should be in every gang that is required to do work that requires trench pumps of more than the small capacity of a hand pump.

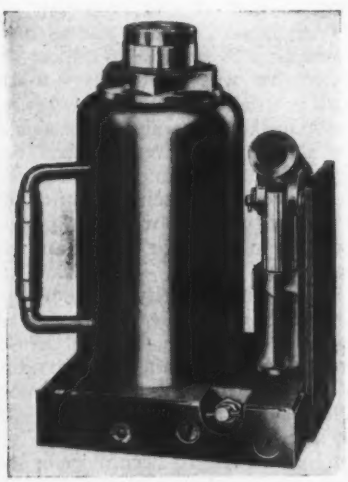
PRODUCTS of Manufacturers



New Duff-Norton 25-Ton Hydraulic Jack

A NEW hydraulic jack with a capacity of 25 tons has been introduced by the Duff-Norton Manufacturing Company, Pittsburgh, Pa. With a closed height of 10 in., the new jack is said to be well suited for railway bridge and building work where space is limited, and also to have many applications in shops and enginehouses. Known as the Duff-Norton Hy-Power Hydraulic Journal Jack, the new jack is one of a series of eight Hy-Power Hydraulic models.

A dual-pump arrangement is provided on the new 25-ton jack whereby it is claimed that the cap can be brought up to load height instantly by means of a speed pump, after which a switch-over is made to the power pump without changing or missing a lever stroke. A safety by-



The 25-Ton Model Duff-Norton Hy-Power Hydraulic Jack

pass prevents the load from being lifted beyond the safe limit of 6¾ in.

The jacks in the Hy-Power Hydraulic line include models with capacities varying from 3 to 50 tons. The heavy-duty models, with capacities of 20, 25, 30 and 50 tons, have the dual-pump feature and special alloy-steel bases to accommodate the heavier loads. The lighter models utilize an extension screw to raise the cap to load height rather than the dual pumps, and have one-piece bases of malleable iron. These jacks have capacities of 3, 5, 8 and 12 tons.

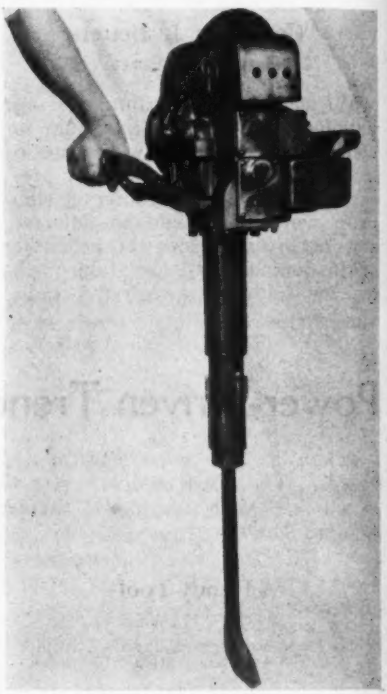
All models of the jacks have rams and cylinders of high-carbon seamless steel tubing, said to be precision ground for close fit and smooth operation. Also, the jacks have oil filter screens, and are each fitted with a gage calibrated to show the weight of the lifted load.

Unit Tie Tamper

THE Chicago Pneumatic Tool Company, New York, is now producing a new gasoline-engine-driven self-contained tie tamper, known as Model CP-5. Although it was developed prior to the war, production of the tool on a large scale was not possible until recently because the company's plants were devoted largely to war work and because the manufacture of the tool entailed the use of considerable aluminum and other critical metals.

The tamper is powered by a two-cycle, air-cooled engine that, indirectly, delivers 1400 blows a minute at the tamping bar. It is equipped with magneto-type ignition, a starting crank, has automatic lubrication, and is provided with two grip handles, one of which also serves as the starting crank. In operation, the machine is started by a downward push on the cranking handle (the starting principle being the same as that of a motorcycle crank), which gives the engine at least four complete revolutions. After starting, the handle is returned to its original position, where it is automatically locked in place and serves as the upper grip handle.

The tamping bar is actuated by compressed air produced in the striking mechanism, which throws a striking piston against the tamping bar and also cushions the piston on its return stroke. It is claimed that this feature protects the engine and other vital parts from impact and shock loads, substantially prolonging the service life of the machine, and reduces vibration in the grip handles to a minimum. The weight of the tamper is said to be concentrated up close to the oper-



The CP-5 Gasoline Tie Tamper

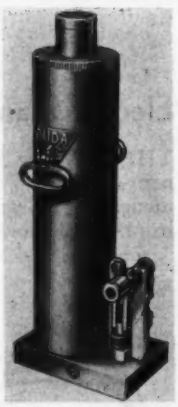
ator between the two grip handles to facilitate its movement from one spot to another, and that the compact design employed permits unhampered visibility of the bar.

The weight of the tamper complete with the bar is 73 lb., which is said to be adequate to preclude the necessity of the operator applying any pressure, or his own weight, to the unit for its proper functioning. The capacity of the fuel tank is 4½ pints which, it is claimed, is sufficient, taking into account normal train interruptions, to permit the unit to perform for four hours before refilling becomes necessary. The fuel tank can be filled when the tamper is standing up or lying down.

Operating on a gasoline-oil mixture, as used in other maintenance-of-way equipment, the entire machine is lubricated by the oil in the fuel, with the residue oil in the crankcase passing into the gear case, from which it flows through the striking mechanism and bar snubber. Standard equipment includes one tamping bar for rock ballast, while optional equipment includes other bars for small rock ballast, washed gravel, slag, cinders, dirt, sand, etc., while toothed-type tamping bars are furnished on special order.

Buda 50-Ton Jacks

TWO models of 50-ton hydraulic jacks, capable of 7-in. and 20-in. lifts, have been added to the line of jacks produced by the Buda Company, Harvey, Ill. The new jacks are designed especially for general high lifting jobs, and are applicable for use in the railroad field in bridge work and in repair shops of various types.



The Buda Model 50-B-26 Two-Speed Hydraulic Jack

A feature of the new models is a two-speed arrangement that is said to permit light or medium-heavy loads to be lifted rapidly, while normal or standard speed is used for capacity loads. The raising of the loads is said to be accomplished by an easy pumping action, while the lowering movement is regulated by a simple control valve. It is claimed that the loads may be held indefinitely at any height.

The two new jacks are known as Models 50-B-12 and 50-B-26. Model 50-B-12, with a 7-in. rise, has a height when closed of 12 in. and weighs 120 lb. Model 50-B-26, with a rise of 20 in., has a 26-in. closed height and a weight of 200 lb.

New Electrode Coating

THE Air Reduction Sales Company, New York, has announced the availability of a new extrusion-coated self-hardening electrode which is said to lay down metal having excellent resistance to impact and abrasion, being particularly suitable for hard-facing or for building up worn areas on tractor lugs, shovel teeth, bulldozer, and other earth-moving equipment. Having arc characteristics equally suitable for working with either an a-c or d-c machine, it is claimed that the electrode is completely uniform in texture.

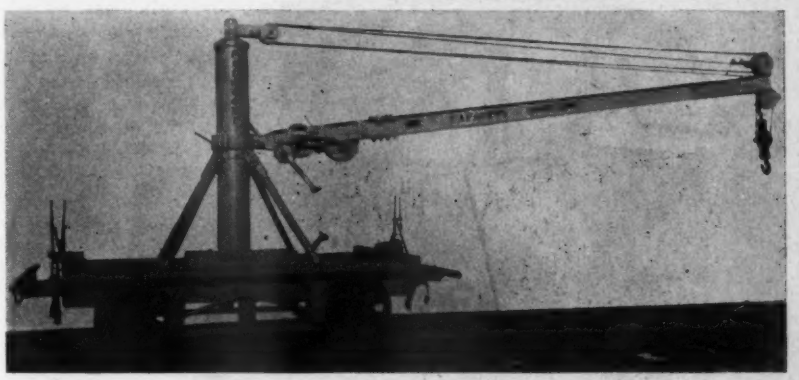
Other advantages claimed for the new extrusion-coated electrode are: No slag interference; a more rapid deposition rate than dipped-type electrodes; its ability to be applied in all positions; no loss of hardness or wear resistance on multiple layers; solid, dense deposits with a minimum of porosity; satisfactory application within a wide range of amperages; easy slag removal while deposit is in red-hot condition; and any desired type of bead can be applied, including stringers, figure eights, crescents, weaving beads, etc.

Derrick Car

A NEW derrick car, designated as the W64 Series A, has been developed by Fairmont Railway Motors, Inc., Fairmont, Minn., which is designed for the safe and rapid handling of materials and equipment weighing up to 3,000 lb. It is said to be particularly adaptable to setting track and grade-crossing signals, battery wells, and other signal facilities, but that it can also be used to advantage on many other lifting jobs.

It is equipped with a 13-ft. boom, of double 5-in. channel construction, which has a full 360-deg. pivot and which may be locked in any position by a cam-actuated clamp. The hoist has a 3-part line and the boom an 8-part line, both of 5/16-in. improved plow steel cable, each of which can be operated at two speeds through cast steel bronze-brushed sheaves. The winches permit either one or two-man operation, and a sturdy band brake is provided to control the lowering of the load.

The frame is made of steel channels and angles with braces and gussets, and employs the box-type of construction for the derrick support. The car is equipped with 16-in. demountable wheels on 1 15/16-in. axles, one of which is of the differential type, with both axles having tapered roller bearings. It is also equipped with four adjustable rail clamps, two of them insulated, which are controlled from the deck by levers. The clamps are adjustable to various weights of rail, and have automatic clamp and release. The entire unit weighs 2,100 lb. but, because it has extension lift handles at one end, the lift weight is only 320 lb. A six-foot safety coupler is supplied for towing the derrick behind a motor car. The brakes are of the four-wheel, self-centering type and are operated by a foot-pedal having a ratchet lock.



The Fairmont W64 Series A Derrick Car

Rail-Flaw Detector

TELEWELD, Inc., Chicago, has announced the development of a rail-flaw detector car, which is said to be capable of detecting and recording transverse fissures throughout the length of the rail to within three inches of the ends. The new unit, which is to be made available to the railroads through Teledetector, Inc., is known as the Teledetector car. It is a small, self-contained, self-propelled unit, with enclosed body, mounted on four flanged wheels, which may be readily placed on and removed from the track by two men. To retain the features of light weight and simple operation, the car is designed to test one rail at a time. However, an arrangement of two cars, operating about ten rails apart, and in effect testing both rails at once, is said to produce an efficient operation in which only one flagging set-up and a single section crew are required for changing out rails in which defects are found.

Detection of rail flaws is accomplished by small, air-core, pick-up coils operating in a trailing, sustained magnetic field. By this method, the unit is said to detect fissures as small as 15 per cent, as well as other types of flaws in the rail head, and is not subject to interference from joint bars, bolt holes, high spikes or other track fastenings. It is further claimed that the car may be operated successfully through switches, frogs and guard rails.

The magnetic field in the rail head is set up by a multi-pole magnet unit which, enclosed in an aluminum case mounted on small rollers, is pushed ahead of the detector car to which it is attached by means of a bracket. In order that the position of the magnet unit may be changed for testing the opposite rail or testing in the reverse direction without turning the car, a bracket is provided at each corner of the car. Two pick-up coils are provided, one of which is suspended over each rail between the car wheels in such manner that it clears the surface of the rail by about ⅛ in.

A moving-tape recording unit, a paint gun and a standard type, voltage-drop, hand-testing apparatus complete the new unit. Four recording pens are provided, three of which are said to record rail-head defects, while the fourth records the locations of joints. The paint gun is automatic and, it is claimed, will place a spot of paint on the rail within one inch of the location of a flaw.

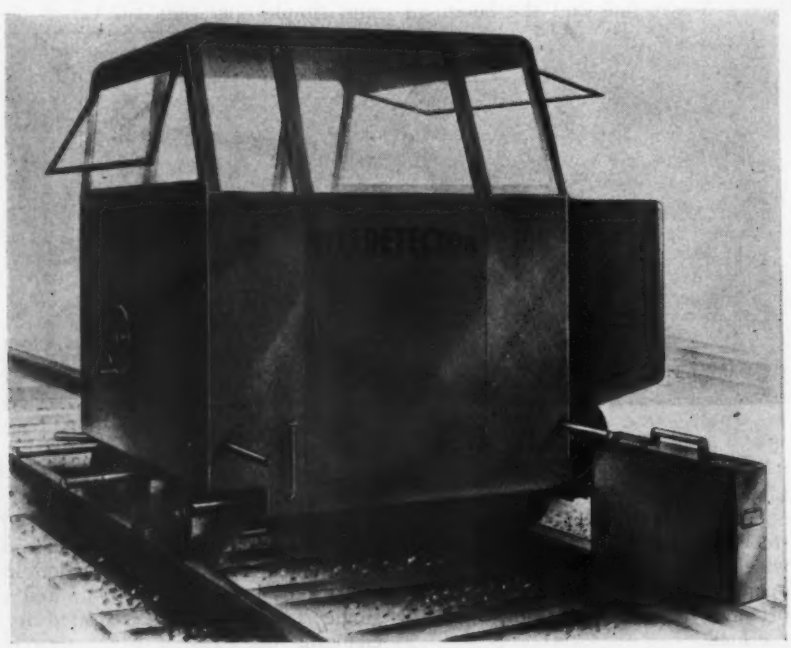
The power requirements of the testing equipment are provided by a 3½-k.w. main generator driven by an 11-hp. gasoline engine. The generator also supplies power for a constant-speed electric motor connected to the travel gear, which propels the car while testing, at a speed of 5 m.p.h. At other times, such as when running to clear, the car is propelled by the gasoline engine through a transmission and chain drive, an arrangement which is said to permit running speeds up to 25 m.p.h.

The car body of magnesium alloy, is fully enclosed and has plexiglass windows. The power units are located in an overhang on one side of the car, but within standard clearance limits, a feature which is said to aid in balancing the weight of the car for easy removal from the track. When it is necessary to remove the car, a pair of rubber-tired wheels, mounted at right angles to the track below the overhang, are lowered to touch the ground. A pair of extension lifting handles on the opposite side of the car is then used to lift the car and move it laterally off the track, the lift, it is said, being only 250 lbs. on the handles.

A crew of two men is said to be sufficient to operate the Teledetector car. It is pointed out that the Teledetector apparatus, with duplicate magnetizing units and pick-up coils, can be installed on any standard automobile-type inspection car, thus permitting the testing of both rails at the same time. With this type installation, which utilizes heavier magnetizing apparatus, it is said that the efficiency of the equipment is increased permitting detection of 10 per cent fissures and smaller.

Reproduction of a Section of Teledetector Recording Tape

An indication of a 35-per cent transverse fissure, within the limits of the joint bar, is shown at the left, which was recorded through both the gage and center coils. The sliver (SL) was recorded by the field coil only, the shell (S) by the gage coil only, and the burn (B) by the center coil only. The 40-per cent fissure, near the right of the tape, was recorded by all three pens.



The Teledetector Rail Flaw Detector Car

Electric Hand Lamp

THE U-C Lite Manufacturing Company, Chicago, has announced a new model Big Beam portable, electric hand lamp, known as No. 211, which

The Big Beam No. 211 Electric Hand Lamp

is said to be useful in many types of railway night and emergency work where a steady, bright light is needed. The new lamp, which weighs approximately 5 lb., is much lighter than the earlier model, No. 700, and uses two standard dry-cell batteries.

Other new features include a focusing adjustment which is said to permit a sharp 1500-ft. beam or a bright localized light. Also, the light has an auxiliary lamp which, together with the main lamp, is controlled by a double-throw main switch, and a new type of case featuring a pressure connection, rather than the usual wire connection. The type of connection used is said to permit the use of only one battery in emergency.

Changes in Railway Personnel

General

L. E. Thornton, recently released from the armed forces, has been appointed superintendent of the Baltimore & Ohio Chicago Terminal.

W. H. Moore, whose promotion to assistant division engineer on the Southern, Atlanta, Ga., was reported in the April issue, has been advanced to trainmaster on the Atlanta division, with the same headquarters.

S. M. Golden, vice-president, maintenance of way, structures, equipment and stores, of the Chicago Great Western, has been elected vice-president, operations, with headquarters as before at Chicago.

H. B. Voorhees, vice-president and executive representative of the Baltimore & Ohio, and president of the Baltimore & Ohio Chicago Terminal, with headquarters at Chicago, and an engineer by training, has retired after 44 years of service.

J. C. Nickerson, division engineer on the Louisville & Nashville, at Latonia, Ky., has been promoted to superintendent of the Eastern Kentucky division, with headquarters at Ravenna, Ky., succeeding **E. C. Sparks,** who has retired because of ill health.

F. E. Bates, whose appointment as senior executive assistant in charge of the Gulf Coast Lines and the International-Great Northern, with headquarters at Houston, Tex., was reported in the July

F. E. Bates

issue, was born at Allison, Iowa, on January 3, 1889, and was graduated from the University of Wisconsin in 1908. Following graduation he entered railroad service in the engineering department of the Chicago, Milwaukee, St. Paul & Pacific, but left the next year to go with the Kansas City Terminal as a draftsman. Eight months later he re-entered the service of the Milwaukee. Mr. Bates went with the Missouri Pacific on November 13, 1913, as an assistant engineer, and in 1919 he was promoted to assistant bridge engineer. On August 1, 1923, he was advanced to bridge engineer, and in July, 1938, he was promoted to chief engineer. In June, 1945, he was advanced to executive assistant of the Missouri Pacific at St. Louis, Mo., the position he held at the time of his new appointment.

Engineering

A. H. Schmidt, assistant engineer on the New York Central, at Cincinnati, Ohio, has been transferred to Cleveland.

H. A. Lind, assistant engineer on the Chicago, Burlington & Quincy, has been appointed senior assistant engineer, with headquarters as before at Chicago.

R. E. Peck, assistant engineer of the Missouri Pacific, at St. Louis, Mo., has been promoted to assistant bridge engineer, with the same headquarters.

L. S. Crane, assistant chief material inspector on the Southern, at Alexandria, Va., has been appointed assistant engineer of tests, with the same headquarters.

E. C. Hoyer, Jr. has been appointed engineer of buildings on the Chesapeake & Ohio, with headquarters at Richmond, Va.

W. T. Davis, designing engineer on the Chesapeake & Ohio, at Richmond, Va., has been appointed assistant office engineer, with the same headquarters.

J. W. McReynolds, assistant division engineer on the Chicago, Milwaukee, St. Paul & Pacific, at Aberdeen, S.D., has been transferred to La Crosse, Wis.

R. E. Patterson, chief engineer, maintenance and construction, on the Lehigh Valley, at Bethlehem, Pa., has been transferred to the new offices of the chief engineer at New York.

J. L. Loida, assistant chief engineer of the Illinois Terminal, at St. Louis, Mo., has been promoted to chief engineer, with the same headquarters, succeeding **J. I. Catherman,** who has retired after 34 years of service.

H. M. Hoffmeister, recently released from the armed forces, has been appointed assistant engineer, water service, on the Missouri Pacific, with headquarters at Houston, Tex.

W. E. Ross, assistant engineer on the Chicago, Milwaukee, St. Paul & Pacific, at Bensenville, Ill., has been appointed division engineer on the Idaho division, with headquarters at Spokane, Wash., replacing **E. H. Johnson,** who becomes a budget engineer at Chicago.

W. E. Kearfott, division engineer of the Akron division of the Baltimore & Ohio, with headquarters at Akron, Ohio, has been transferred to Punxsutawney, Pa., as division engineer of the Buffalo division. **J. G. Collinson,** division engineer at Punxsutawney, has been transferred to Connellsville, Pa., on the Pittsburgh division, succeeding **Guy Long,** who in turn has been transferred to Akron, succeeding Mr. Kearfott.

A. B. Chapman, bridge engineer of the Chicago, Milwaukee, St. Paul & Pacific, at Chicago, has been promoted to engineer and superintendent of bridges and buildings with the same headquarters, assuming in addition to his regular duties, those of **Gunnar Tornes,** superintendent of bridges and buildings, who has retired.

G. E. Shaw, whose appointment as engineer of bridges of the Canadian Pacific, with headquarters at Montreal, Que., was reported in the July issue, was born at Windsor, Ont., and was graduated from McGill University (M.S. civil engineer-

G. E. Shaw

ing). He entered railroading in 1925 as a draftsman for the Canadian Pacific, at Montreal, and advanced to become assistant engineer of bridges in 1941. He held this position at the time of his recent advancement.

G. W. Miller, whose appointment as district engineer, Ontario district, on the Canadian Pacific, with headquarters at Toronto, Ont., was reported in the May issue, was born at Burlington, Wash., on May 31, 1905, and was educated at the University of British Columbia. He entered the service of the Canadian Pacific on August 15, 1927, as a transitman, became roadmaster at Empress, Alta., in 1933, and was transferred to Knee Hill, Alta., in 1934. In 1938 Mr. Miller was appointed division engineer at Revelstoke, B.C., and in 1943 he was advanced to assistant engineer maintenance of way, at Toronto, the position he held at the time of his recent promotion.

Andrew R. Ketterson, whose retirement as engineer of bridges on the Canadian Pacific, at Montreal, Que., was announced in the July issue, was born on June 24, 1881, at Greenock, Scotland, and was graduated from the Royal Technical college at Glasgow (C.E.). He entered railroading as a bridge inspector for the C.P.R. in 1907, advancing to assistant engineer in 1910, and leaving in 1916 for military service. Serving as a major in the Canadian Expeditionary Forces in France, he was awarded the Distinguished Service Order. Mr. Ketterson returned to the Canadian Pacific in 1919 as assistant to engineer of bridges, and was promoted

to assistant engineer of bridges in 1928. His advancement to the post from which he now retires was made in 1937.

W. W. Greiner, whose appointment as chief engineer on the Gulf, Mobile & Ohio, with headquarters at Mobile, Ala., was reported in the June issue, was born at Orange, Va., on February 10, 1905, and graduated from Virginia Military Institute in 1926. He entered railroad service on July 5, 1936, as a student apprentice on the Southern, became assistant track supervisor at Dayton, Tenn., in 1928, and assistant to roadmaster at Somerset, Ky., in 1929. From 1930 to 1933 he served as track supervisor at Tuscaloosa, Ala., and as assistant trainmaster at Columbia, S. C., from 1933 to 1934, when he was appointed trainmaster at Orangeburg, S.C. Mr. Greiner was transferred to Richmond, Va., in 1937, and three years later to Birmingham, Ala. From January, 1942, to October, 1945, he served in the armed forces, from which he was discharged with the rank of colonel. He entered the service of the Gulf, Mobile & Ohio on January 1, 1946, as engineer of maintenance of way, the position he held at the time of his recent promotion.

Joseph W. Smith, whose retirement as chief engineer of the Erie, at Cleveland, Ohio, was announced in the July issue, was born at Hazelton, Pa., on August 8, 1879, and was graduated from Lafayette College (C.E., 1904). Mr. Smith entered railway service with the Erie in June, 1904, as a transitman on preliminary

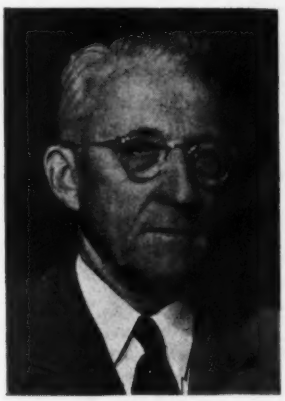
J. W. Smith

surveys, and in September, 1905, was promoted to inspector of construction work. Promoted to resident engineer, terminal improvements, in February, 1907, he later served on double-track and grade-reduction work, and in February, 1912, became assistant engineer, double track and grade reduction. He was advanced to district engineer with supervision over terminal improvements, headquarters at New York, in February, 1913, and four years later was appointed assistant valuation engineer, becoming general office engineer in 1925 and principal assistant engineer, at New York, in 1929. Mr. Smith had served as chief engineer since 1941.

The following appointments in the engineering department have been announced by the New York, New Haven & Hartford: **Floyd J. Pitcher,** engineer of structures and design, appointed assistant to chief engineer in charge of design and construction, with headquarters as before at New Haven, Conn. **George F. Hand,** general assistant engineer, appointed assistant to chief engineer, in charge of special developments, with headquarters as before at New Haven. **William T. Dorrance,** assistant to chief engineer, appointed consulting engineer, with headquarters as before at New Haven. **Albert A. Cross,** division engineer at Hartford, Conn., appointed general assistant engineer at New Haven. **Gray W. Curtiss,** division engineer, appointed district engineer, with headquarters as before at New Haven. **George P. Elliott,** division engineer, appointed district engineer, with headquarters as before at Boston, Mass. **Thure P. Polson,** engineer of track, appointed assistant to engineer maintenance of way, with headquarters as before at New Haven. **John B. Bell,** division engineer at Providence, R.I., appointed engineer of track at New Haven. **James L. Rippey,** assistant engineer of structures, appointed general supervisor of bridges and buildings, with headquarters as before at New Haven. **Charles D. Prentice,** office assistant to chief engineer, appointed division engineer, with headquarters as before at New Haven. **Sydney J. Polson,** assistant division engineer, New Haven, appointed division engineer at Boston. **Harry B. Bussing,** assistant division engineer, Boston, appointed division engineer at Providence. **Henry K. Hislop,** assistant division engineer, Providence, appointed division engineer at Hartford. **Erwin A. Davidson,** architectural draftsman, appointed assistant construction engineer at New Haven. **Albert A. Cawood,** bridge inspector, Boston, appointed assistant bridge engineer at New Haven. **George K. Merrill,** track supervisor at Hartford, appointed assistant division engineer at New Haven. **Harold W. Jenkins,** bridge and building supervisor, appointed assistant division engineer, with headquarters as before at Boston. **Ernest L. Mortimer,** bridge and building supervisor at Hartford, appointed assistant division engineer at Providence.

M. A. McGee, assistant engineer on the Louisville & Nashville, at Louisville, Ky., has been appointed assistant division engineer on the Evansville division, with headquarters at Evansville, Ind., replacing **P. W. Starks,** whose retirement as roadmaster is reported elsewhere in these columns. **James K. Gloster,** assistant engineer at Louisville, has been appointed assistant division engineer, with the same headquarters, replacing **R. L. Samuell,** who becomes assistant engineer. **R. B. Lindsey,** assistant engineer at Knoxville, Tenn., has been transferred to Ravenna, Ky., where he succeeds **E. B. Powell,** who becomes assistant engineer at Louisville. **James P. Bolling,** draftsman at Louisville, has been promoted to assistant engineer at Knoxville, replacing Mr. Lindsey. **Maurice R. Black,** assistant division engineer at Evansville, has been promoted to division engineer at Latonia, Ky., replacing **J. C. Nickerson,** whose appointment as superintendent at Ravenna is reported elsewhere in these columns. **G. R. Sproles,** assistant engineer at Louisville, has been promoted to assistant division engineer at Evansville, succeeding Mr. Black. **Marow W. Cox,** draftsman at Louisville, has been promoted to assistant engineer on the Louisville division, with the same headquarters, replacing **Chas. Stoecker,** who becomes assistant engineer, also at Louisville.

Charles H. Splitstone, whose retirement as assistant chief engineer of the Erie, at Cleveland, Ohio, was announced in the July issue, was born at Linesville, Pa., on January 19, 1878, and attended Pennsylvania State college. He entered railway service in 1901 as a rodman on the



C. H. Splitstone

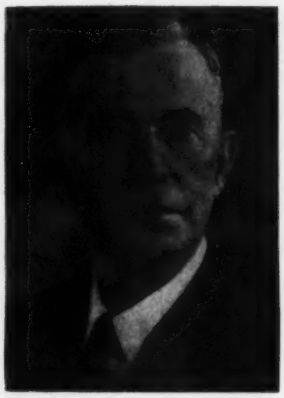
Pennsylvania, lines west of Pittsburgh, with headquarters at Bedford, Ohio. In 1903 he was promoted to chief of party, with headquarters at Chicago, and two years later was transferred to Pittsburgh, Pa. Mr. Splitstone went with the Erie in 1906 as chief of party at Olean, N.Y., later being promoted to resident engineer, and in 1909 was advanced to chief draftsman, with headquarters at New York, being promoted to office engineer in 1917, and thereafter advanced through the positions of engineer of construction, superintendent of construction, and superintendent of construction and surveys, with headquarters at Cleveland. In 1941 he was promoted to the position from which he recently retired.

Robert F. Wood, acting bridge engineer of the Reading, at Philadelphia, Pa., has been appointed bridge engineer, succeeding **Percival S. Baker,** assistant chief engineer at Philadelphia, who retired on May 31 after more than 40 years' service. Mr. Baker was born on November 13, 1877, at Philadelphia, and was graduated from the University of Pennsylvania (B.S. 1899, M.S., 1900). He entered railway service as a rodman for the Philadelphia & Reading (now the Reading) in 1899. From 1900 to 1905 he served as a draftsman for the American Bridge Company, then joined the Philadelphia Rapid Transit Company in this capacity, and went with the Philadelphia & Reading in 1906 as a computer. Mr. Baker was advanced to assistant engineer in 1914 and to engineer of bridges and buildings in 1918, becoming engineer of bridges in 1927. He maintained the latter post until 1943, when

he was promoted to assistant chief engineer, the position he held at the time of his retirement.

R. W. Willis, principal assistant engineer of the Chicago, Burlington & Quincy, at Chicago, has been promoted to assistant chief engineer, with the same headquarters, a newly-created position. The position of principal assistant engineer has been abolished.

Mr. Willis was born at Charlestown, W. Va., on July 27, 1874, and was graduated from Virginia Military Institute in 1895. He entered railway service on April 18, 1896, as a rodman on the Lake Shore & Michigan Southern (now a part



R. W. Willis

of the New York Central), resigning the following year to engage in real estate business. He reentered railway service on April 8, 1898, as a rodman on the Burlington, and on August 1, 1902, he went with the Cincinnati Northern (now part of the New York Central) as assistant to the chief engineer. Mr. Willis returned to the Burlington in April, 1903, as an assistant engineer on construction work, and on January 1, 1905, he was promoted to division engineer at Galesburg, Ill. Two years later he was advanced to district engineer, with headquarters at St. Louis, Mo., and on February 1, 1914, he was transferred to Chicago. He was later appointed division engineer of the Galesburg and Beardstown divisions, with headquarters at Galesburg, and in the summer of 1936 he was promoted to assistant engineer, with headquarters at Chicago. On May 16, 1939, Mr. Willis was appointed principal assistant engineer, with headquarters at Chicago, the position he held at the time of his recent promotion.

R. A. Emerson, whose promotion to district engineer on the Canadian Pacific, with headquarters at Vancouver, B.C., was reported in the May issue, was born on April 12, 1911, at Plum Coulee, Man., and was educated at the University of Manitoba and at Yale University. He entered the service of the Canadian Pacific in 1928, and until he joined the regular staff in 1935, he served during the summers as rodman, inspector of rock ballasting, transitman, instructor in civil engineering at the University of Manitoba, locating engineer, and instrumentman for the Department of Northern Development of the provincial government. On April 1, 1935, Mr. Emerson was appointed transitman at Vancouver, and later served in that capacity at Revelstoke, B.C., and at Regina, Sask. In 1939 he became roadmaster at Delorraine, Man., and subsequently, division engineer at Moose Jaw, Sask. In 1944 he was appointed assistant district engineer at Vancouver, the position he held at the time of his recent promotion.

Track

Donald F. Unangst has been appointed supervisor of track of subdivision No. 7 of the Delaware, Lackawanna & Western, with headquarters at Norwich, N.Y.

P. W. Starks, roadmaster on the Louisville & Nashville, with headquarters at Evansville, Ind., has retired.

J. M. Gravel, roadmaster on the Canadian National, at Victoriaville, Que., has been transferred to Parent, Que., succeeding **A. Dewar,** who has retired.

L. J. Crang, roadmaster on the Canadian Pacific, with headquarters at Outlook, Sask., has retired after 35 years of service. **C. Johnson,** roadmaster at Suffield, Alta., has retired.

Neil C. Holmes, instrumentman on the Ashland division of the Chicago & North Western, at Ironwood, Mich., has been appointed roadmaster, subdivision No. 3, with headquarters at Fond du Lac, Wis., succeeding **C. A. Brill,** deceased.

M. V. Parker, supervisor of track on the Chicago, Burlington & Quincy, at Lincoln, Neb., has been appointed roadmaster at Sterling, Colo., replacing **C. B. Young,** whose transfer to Greybull, Wyo., was reported in the June issue.

Fred Morris, general foreman on the Erie, at Buffalo, N.Y., has been promoted to track supervisor, with headquarters at Hornell, N.Y., succeeding **J. G. Ainey,** whose appointment as assistant division engineer at Marion, Ohio, was reported in the July issue.

W. K. Putney, assistant supervisor of track on the Mountain subdivision of the Chesapeake & Ohio, at Clifton Forge, Va., has been promoted to supervisor of track on the Piedmont subdivision, with headquarters at Richmond, Va., succeeding **J. E. Stennett,** transferred. **C. M. Kern,** assistant cost engineer at Clifton Forge, has been appointed assistant supervisor of track, with the same headquarters, replacing Mr. Putney.

C. P. Willis, supervisor of track on the Grand Rapids division of the Pennsylvania, at Kalamazoo, Mich., has been appointed assistant engineer on the Indianapolis Union, with headquarters at Indianapolis, Ind., succeeding **J. G. Bingham,** deceased. **E. Wollett,** assistant supervisor of track on the New York division, at New Brunswick, N.J., replaces Mr. Willis as supervisor of track at Kalamazoo. **W. H. Shoemaker,** recently released from the armed forces, has been appointed assistant supervisor of track, succeeding Mr. Wollett. **A. M. Schofield,** recently released from the armed forces and formerly assistant supervisor of track at Canton, Ohio, has been appointed supervisor of track at Niles, Ohio. **W. N. Taggart,** assistant on the engineer corps on the New York division, has been promoted to assistant supervisor of track on the Erie and Ashtabula division, with headquarters at Niles. **L. A. Pelton,** assistant on the engineering corps, Western region, has been appointed assistant supervisor of track on the Maryland division, with headquarters at York, Pa. **W. G. Goellner,** assistant on the engineering corps, Central region, has been appointed assistant supervisor of track on the Williamsport division, with headquarters at Williamsport, Pa. **T. C. Netherton,** assistant on the engineering corps at Wellsville, Ohio, has been appointed assistant main line supervisor of track on the Pittsburgh division, with headquarters at Cresson, Pa. **L. C. Martoia,** supervisor of track on the Eastern division, at Freedom, Pa., has been transferred to the Panhandle division, with headquarters at Zanesville, Ohio, replacing **A. C. Haines,** who has been granted a leave of absence on account of ill health.

Bridge and Building

G. F. Rapp, bridge and building foreman on the Pennsylvania, has been appointed acting master carpenter on the Delmarva division.

M. H. Ferry has been appointed master carpenter of the Erie, with headquarters at Hornell, N.Y., replacing **E. J. Holmes,** who has been transferred to Huntington, Ind.

Alex L. McCloy, supervisor of bridges and buildings on the Toledo-Ludington division of the Pere Marquette, with headquarters at Saginaw, Mich., has retired after 39 years of service.

E. B. Jones has been appointed assistant supervisor of bridges and buildings on the Clifton Forge division of the Chesapeake & Ohio, with headquarters at Clifton Forge, Va.

S. H. Poore has been appointed assistant general supervisor of bridges and buildings of the Chesapeake & Ohio, with headquarters at Richmond, Va., succeeding **F. B. Robins,** whose resignation to join another road was reported in the March issue.

Obituary

Edward McCrea, who retired in 1938 as roadmaster on the Canadian Pacific, with headquarters at Sudbury, Ont., died recently at Parry Sound, Ont.

Arthur G. Holt, who retired in 1938 as assistant to the chief engineer of the Chicago, Milwaukee, St. Paul & Pacific, died in Evanston, Ill., on June 28.

C. H. Rodeniser, retired general scale inspector on the Norfolk & Western, at Roanoke, Va., died on June 26.

Clarance L. Persons, who retired last December as assistant to the executive vice-president of the Chicago, Burlington & Quincy, with headquarters at Chicago, died at his home in Waukegan, Ill., on

June 30. A biographical sketch of Mr. Persons' career appeared in the February issue in connection with his retirement.

John Foley, forester of the Pennsylvania, with headquarters at Philadelphia, Pa., whose death at Wayne, Pa., on May 17 was reported in the June issue, was born at New York City on August 1, 1880, and began his railroad career on May 7, 1907, as first assistant forester on the Pennsylvania. From July, 1910, to February, 1912, he served as acting chief inspector of maintenance of way lumber, the duties of which position were added to those of forester, the position he assumed on February 15, 1912. On January 1, 1927, he was appointed assistant to the purchasing agent, and on May 1, 1928, to assistant purchasing agent. On July 16, 1932, he resumed the position of forester, and served in that capacity until his retirement on March 1, 1946. During both World Wars, Mr. Foley was loaned by his railroad to government agencies. During World War I, he served the United States Railroad Administration as associate manager, Forest Products Section. Before, during and after World War II, he served as head commodity specialist and technical consultant on forest products problems in the Office of Production Management, War Production Board, and Civilian Production Administration. Mr. Foley was a fellow in the Society of American Foresters, a member of the Advisory board of the Charles Lathrop Pack Forestry Foundation, a past-president and honorary member of the American Wood Preservers' Association, and chairman of the Central Committee on Lumber Standards. In addition, he was a member of the Committee on Ties of the American Railway Engineering Association for more than a quarter of a century; for a period of 11 years he acted as vice-chairman of the committee, and for an equal number of years he was chairman.

John Foley

Master Valve Control—The Permutit Company, New York, has issued a booklet describing automatic control, by means of a master valve, to regulate the flow and to prevent the waste of water when backwashing and rinsing gravity and large-size pressure filters, or zeolite softeners.

Association News

Roadmasters' Association

At a meeting of the Executive committee in Chicago on July 15 major attention was given to the consumption of plans for the annual meeting to be held at the Hotel Stevens, Chicago, September 17-19, and to a review of the technical committee reports to be presented at the annual meeting.

This year, as reported previously, the Roadmasters' convention will be held simultaneously with, but independent of, the annual convention of the American Railway Bridge and Building Association, and will be supplemented by a large exhibit of materials and equipment in the exhibit hall of the Stevens, sponsored jointly by the Track Supply Association and the Bridge and Building Supply Men's Association.

Arrangements have not been completed for all features of the convention, but the program, which will be published in full in next month's issue, calls for addresses and reports on the following subjects:

Problems Ahead in Railway Transportation
Safety in Maintenance of Way Work
The Achievements of the "Boys" in Company A, Military Railway Service
Reducing Maintenance of Way Costs
Developments in Roadbed Grouting
Assembled Installation of Special Trackwork
Theory and Practice in Ballast Cleaning
What Size and Design of Tie Plates?
Report on Selection and Maintenance of Ballast
Report on Tie Failures and Measures to Overcome Them
Report on Inspection of Rail by Track Forces
Report on Programming Work to Obtain Maximum Use of Power Equipment
Report on Track Maintenance Problems in C.T.C. Territory
Report on Minimizing the Need for Slow Orders

Those who plan to attend the convention are being urged to make their hotel reservations as early as possible, writing directly to H. B. Richardson, Reservation Manager, Hotel Stevens.

American Railway Engineering Association

The Board of Direction plans to hold a meeting on August 6 at Chicago to give consideration to the budget for research work for 1947.

At the request of the Committee on Rail, a letter ballot is soon to be distributed to the membership covering three proposed rail sections and corresponding joint bar assemblies. The proposed sections include one of 115 lb., to replace the existing 112-lb. section, and two sections, one of 132 lb. and one of 133 lb., to replace the present 131-lb. section. Alternate joint-bar assemblies, one head contact and the other head free, are proposed for the two heavier sections.

To date no committee meetings have been scheduled for August. During July, meetings were held by four committees, including the Committee on Water Service and Sanitation, which met at Chicago on July 9; the Committee on Waterproofing, Chicago, July 10; the Committee on Economics of Railway Labor, Chicago, July 25; and the Committee on Iron and Steel Structures, Cincinnati, Ohio, July 31 and August 1.

Those members who have ordered Proceedings with paper and half leatherette bindings will receive their copies early in August. However, because of the difficulty of getting cloth for bindings, those copies of the Proceedings with such covers will not be delivered until some time in September.

Railway Tie Association

Presided over by E. J. McGehee, Wood Preserving Division, Koppers Company, Pittsburgh, Pa., the Railway Tie Association held a highly successful annual convention at the Netherland Plaza Hotel, Cincinnati, Ohio, July 15 and 16, with a program containing many features of interest to railway maintenance officers. Among these were a symposium on What Lies Ahead for the Crosstie Industry? which was participated in by W. J. Burton, assistant to chief engineer, Missouri Pacific, St. Louis, Mo.; G. E. Getty, statistician, Bureau of Railway Economics, Association of American Railroads, Washington, D. C.; and E. D. Jones, T. J. Moss Tie Company, St. Louis. In other addresses, W. G. Vollmer, president, Texas & Pacific, Dallas, Tex., discussed How Rail Transportation Suffers From Unfair Treatment; C. Miles Burpee, vice-president, Simmons-Boardman Publishing Corp., New York, discussed The Active Demand for Lumber and Its Effect on Crossties; L. S. Jeffords, chief engineer, Atlantic Coast Line, Wilmington, N. C., discussed The Nine-Foot Tie on the Atlantic Coast Line; and Clarence S. Burt, manager, Forest Products Bureau, Illinois Central, Memphis, Tenn., discussed The Effect of Traffic on Crossties. The address by Mr. Jeffords on The Nine-Foot Tie on the Atlantic Coast Line is published in the feature section of this issue. Others of the above listed addresses will appear in subsequent issues.

Bridge & Building Association

Plans for the annual convention of the association at the Hotel Stevens, Chicago, September 17-19, concurrent with the annual convention of the Roadmasters' Association and a large exhibit of materials and equipment jointly by the Track Supply Association and the Bridge & Building Supply Men's Association, are practically completed. At a meeting of the Executive committee in Chicago on July 8, plans for the meeting were reviewed in detail, as well as most of the technical committee reports to be presented at the convention. The program for the convention, which will be announced in full in the September issue, will include reports and addresses on the following subjects:

Problems Ahead in Rail Transportation
Safety in Bridge and Building Work
Bridge Operations of the Military Railway Service
Modern Architecture and Materials in Railway Building Construction and Maintenance
Preventing Bridge, Building and Tunnel Fires
Reducing Costs in Bridge and Building Work
Railway Sanitation
Report on Cause and Prevention of Personal Injuries to Bridge and Building Employees
Report on Tools and Equipment for Bridge and Building Shops
Report on Methods of Cleaning Water Lines, Sewers and Drains
Report on Adapting Turntables to Meet Modern Conditions
Report on Servicing Facilities for Diesel Locomotives
Report on Methods of Improving Strength, Durability and Wear Resistance of Concrete

(Continued on page 862)

SCHRAMM *Fordair*

A different and better small compressor . . . . . Powers up to 4 tampers or other tools.

Any man who has to use compressors cannot help being impressed by his first look at the Fordair. He will approve of its compact efficiency; its simplicity. He will say at once that here is a more *useful* compressor for small four-tool crews.

Four of the Fordair's mountings for track maintenance work are pictured below. Besides these there is a skid mounting as well as the "Powair" to replace the motor of a Ford V-8 truck. Other Schramm compressors up to 420 feet capacity are described in the new Schramm catalog. Send for it.

SALIENT FEATURES OF THE FORDAIR

COMPACTNESS—actual dimensions of both motor and compressor only 34 x 34 x 24 inches.

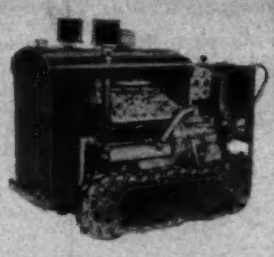
SIMPLICITY—Unit construction; both motor and compressor in same block, both liquid cooled. Same system lubricates both.

BALANCE—Two compressor, two motor cylinders on each side of the Ford-Mercury V-8 block.

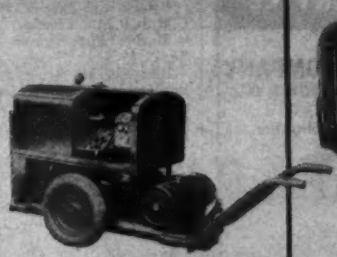
EASE OF MAINTENANCE—Ninety per cent of the Fordair's parts are quickly available from your local Ford-Mercury dealer.

SCHRAMM INC. THE COMPRESSOR PEOPLE WEST CHESTER PENNSYLVANIA

Fordair Model 60 Railcar



Fordair Model 60 Crawler



Fordair Model 60 Tampair

Fordair Model 60 Standard Two-wheel Trailer

Report on Utility and Economy of Pre-Fabricated Buildings

Report on Developments in the Use of Off-Track Work Equipment

Those planning to attend the convention are being urged to make their hotel arrangements promptly, addressing their requests for room reservations directly to H. B. Richardson, Reservation Manager, Stevens Hotel, Chicago.

Track Supply Association; B. & B. Supply Men's Association

Plans have been completed for the large joint exhibit of these two associations at the Hotel Stevens, Chicago, September 16-19, in conjunction with the concurrent annual conventions of the Roadmasters' Association and the American Railway Bridge and Building Association, at the Stevens, September 17-19.

Supplementing the list of 72 companies that had already arranged to exhibit, as published in the July issue, 10 additional companies have contracted to present exhibits, as follows:

Cartier Supply Company
Chicago Steel Foundry Company
E. B. Kaiser Company
Murdock Manufacturing & Supply Company
D. W. Onan & Sons
Overhead Door Corporation
Pittsburgh Pipe Cleaner Company
Syntron Company
Taylor-Colquitt Company
Davey Compressor Company

With these additional companies, the exhibitors total 82 companies, which will occupy 133 booths.

Further inquiries concerning the exhibit should be directed to Lewis Thomas, secretary of the Track Supply Association, 59 E. Van Buren St., Chicago, who is acting as Director of Exhibits.

Wood Preservers' Association

The Executive Committee met at the Forest Products Laboratory, Madison, Wis., July 9 and 10, and made the following committee chairman appointments:

Preservatives—R. H. Baechler, Forest Products Laboratory, Madison.

Oak Ties and Lumber and Piles—P. D. Brentlinger, Pennsylvania, Philadelphia.

Southern Pine Ties and Lumber—E. H. Moore, International Creosoting & Construction Co., Texarkana, Tex.

Gum Ties and Lumber—J. A. Vaughan, Southern Wood Preserving Company, Atlanta, Ga.

Poles, Non-Pressure Treatment—J. P. Wentling, Consolidated Treating Company, Minneapolis.

Intermountain Fir and Western Hemlock—Paul Wayman, American Lumber & Treating Co., Chicago.

Miscellaneous Species, Ties, Lumber, Poles and Piles—J. D. MacLean, Forest Products Laboratory, Madison.

Inspection—H. F. Round, Pennsylvania, Philadelphia, Pa.

Bridge and Structural Timber—T. H. Strate, C.M.St.P.&P., Chicago.

Marine Pile Service Records—A. S. Daniels, Texas & New Orleans, Houston, Tex.

Post Service Records—J. O. Blew Jr., Forest Products Laboratory, Madison.

Diversified Uses of Treated Wood—Leonard Perez, Wood Preserving Division, Koppers Company, St. Louis, Mo.

Uses of Treated Wood for Car Lumber—H. R. Condon, Wood Preserving Division, Koppers Company, Pittsburgh, Pa.

Pressure Treated Foundation Piles—W. A. Stacey, Service Bureau, A.W.P.A., Lawrence, Kan.

Fireproofing—R. H. Mann, Service Bureau, A.W.P.A., New York.

Preservative and Fire-Retardant Treatments of Laminated Members (Plywood and Glued-up Fabrication)—D. L. Lindsley, J. H. Baxter & Co., Los Angeles, Cal.

Supply Trade News

General

The **Flintkote Company,** New York, announces that its new floor coating, which was described in the June, 1946, issue of *Railway Engineering and Maintenance* under the trade name of Flintred, will instead be known and distributed under the trade name of Flintdek.

Personal

Thomas G. Franzreb and **Donald Keating** have been appointed to the technical service division of **Turco Products, Inc.**

William E. Gadd, formerly Eastern sales manager of The Rail Joint Company, Inc., at New York, has joined the **Taylor-Colquitt Company,** Spartanburg, S.C., as special representative to handle the promotion of the firm's vapor drying process.

Edward W. Welp, technical director of the process equipment division of the **Graver Tank & Mfg. Co., Inc.,** East Chicago, Ind., has been appointed sales manager of water conditioning equipment, with headquarters as before at East Chicago.

The railroad sales division of the **Rust-Oleum Corporation,** Evanston, Ill., has expanded the territory of **Joseph M. Welles** to include the entire Pacific Coast area, with headquarters at 5421 Santa Fe Avenue, Los Angeles, Cal.

L. S. Riedel has been appointed regional manager of the construction equipment division of the **Worthington Pump & Machinery Corp.,** with headquarters at 748 Bruckner Boulevard, Bronx, N.Y.

James McComb, formerly with Wooding-Verona Tool Works, and recently returned from military service, has been appointed sales representative of the Ramapo Ajax Division, American Brake Shoe Company, with headquarters at St. Louis, Mo. **C. P. Corrigan,** formerly sales

(Continued on page 864)

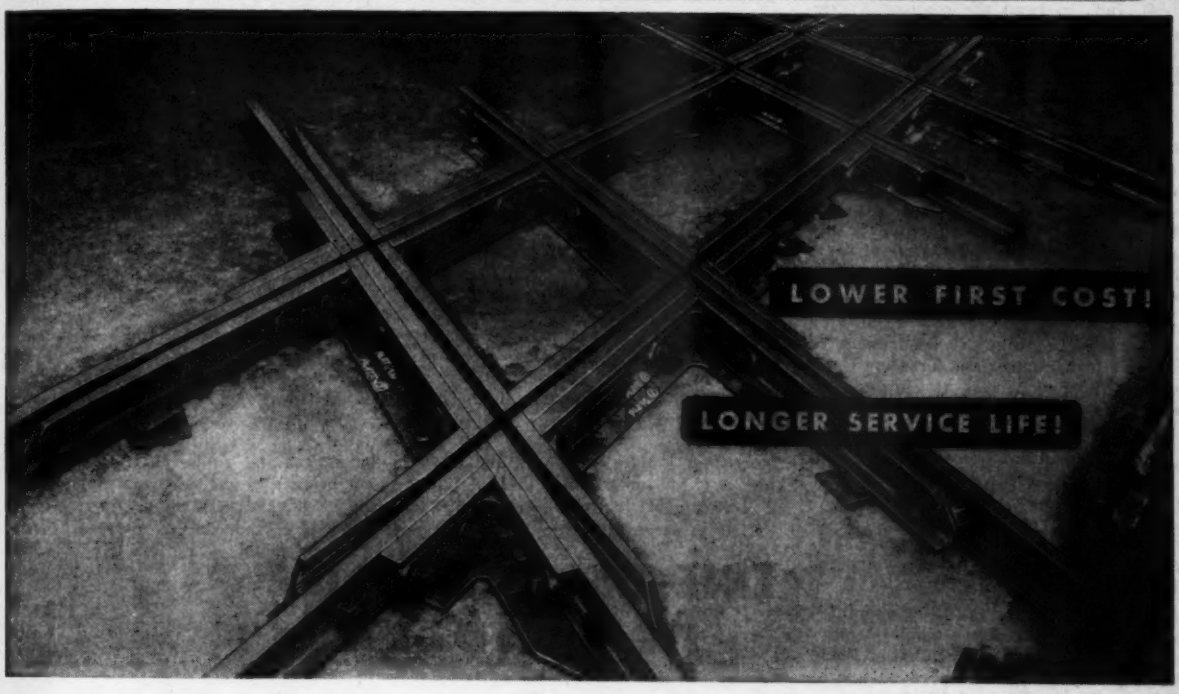
Trade Magazines Adopt New Trim Size

The trim size of business magazines has been fixed at a new standard of 8¼ in. by 11¼ in. as a result of recommendations adopted by the Associated Business Papers during a meeting at Hot Springs, Va., in May, and accepted at the June meeting of the National Industrial Advertisers Association in Atlantic City, N.J. This change will become effective for *Railway Engineering and Maintenance* and other periodicals published by the Simmons-Boardman Publishing Corporation with the September numbers. There will be no change in the dimensions of the type page.

WEIR KILBY HEAT-TREATED

CROSSINGS GIVE CONTINUOUS PERFORMANCE!

Trouble Free



CATALOG "H"

Comprises 154 pages of helpful data, replete with photos, drawings and specifications, covers every track work need. A request on your letterhead will bring your copy promptly.

- Illustration above shows a crossing assembly, in our Cincinnati plant, of a Weir Kilby Heat-Treated Double Track Crossing in 131# RE rail; construction per AREA Plan 701-40 with integral extension base plates.
- All the many operations of machining, heat-treating, assembly and lining have been completed and the unit is now ready for examination by the inspectors.
- WEIR KILBY'S combination of competent engineering, modern machines and experienced operators insure the maximum in HEAT-TREATED CROSSINGS.

Standard and Special Track Work for Steam Railroads Since 1882

WEIR KILBY CORPORATION

CINCINNATI 12, OHIO — BIRMINGHAM 7, ALA.

Successors to

WEIR FROG CO. . . . KILBY FROG & SWITCH CO. . . . CINCINNATI FROG & SWITCH CO.

representative of Ramapo at Chicago, and recently released from naval service, has been appointed sales representative of Ramapo at Cleveland, Ohio.

Buckley M. Byers has been appointed assistant manager of the New York office of the **A. M. Byers Company,** Pittsburgh, Pa., with headquarters at 30 Rockefeller Plaza, and will be in charge of export sales.

Harold C. Conners and **Harold R. Fosnot** have been appointed by the **Graver Tank and Manufacturing Co.,** East Chicago, Ind., to head the company's sales activities in the Chicago area. Mr. Conners will handle steel plate sales; Mr. Fosnot will handle water conditioning equipment.

Richard A. Sweet has been promoted to district sales manager, Cleveland, Ohio, for the **Aluminum Company of America** to succeed **Edward L. Cheyney,** who has relinquished his direct responsibilities in that position. Mr. Cheyney will retire from the firm on October 1, after 41 years of service.

J. P. Johnson, Jr., recently released from the armed forces and formerly a member of the technical department of the **American Lumber and Treating Company,** with headquarters at Chicago, has been assigned to that company's office at Washington, D.C.

J. B. Trotman has been appointed head of the recently-created industrial pump division of **Bowser, Inc.,** with headquarters at Ft. Wayne, Ind. For the last six years Mr. Trotman has been general sales manager of the Blackmer Pump Company, Grand Rapids, Mich.

Steven F. Evelyn has been appointed consulting engineer of construction equipment products of the **Worthington Pump & Machinery Corp.,** with headquarters at Holyoke, Mass. **Howard Platts** succeeds Mr. Evelyn as chief engineer of the portable compressor division.

Stephen H. Newburn has been appointed manager of the Detroit district of the **Air Reduction Sales Co.,** succeeding **G. J. Dekker,** recently elected vice-president of The Ohio Chemical & Mfg. Co., a subsidiary of Air Reduction. **A. C. Brown, Jr.,** has been appointed manager of Air Reduction's Cleveland (Ohio) district, succeeding Mr. Newburn.

Eugene H. Heald, who began work as a draftsman for the **American Bridge Company** 44 years ago, retired on July 1 as vice-president in charge of sales and a director of this subsidiary of the United States Steel Corporation. He is succeeded by **Norman B. Obbard,** who during the war managed the company's Ambridge, Pa., shipyard, supervising the building of 143 Navy combat ships.

C. H. Morse, III, vice-president in charge of research, patents and the western pump division of **Fairbanks, Morse & Co.,** has also been appointed vice-president in charge of manufacturing plants and operations, succeeding to the duties of **A. E. Ashcraft,** who has retired but who will continue as a director of the company. **Henry M. Haase,** assistant manager of the Beloit (Wis.) works of Fairbanks, Morse, has been promoted to works manager, replacing **A. C. Howard,** who has resigned.

Frank K. McDanel, vice-president in charge of manufacturing operations of the **American Bridge Company,** has been elected president of American Bridge and of the **Virginia Bridge Company** (subsidiaries of the United States Steel Corporation), with headquarters at Pittsburgh, Pa., succeeding **Leon A. Paddock,** who has retired. **Austin J. Paddock,** manager of the American Bridge plant at Gary, Ind., has been elected vice-president in charge of manufacturing operations of American Bridge, with headquarters at Pittsburgh, Pa., succeeding Mr. McDanel. **William A. Thiel,** master mechanic at the Gary plant, succeeds Mr. Austin J. Paddock as manager of the plant.

Mr. McDanel began work as a youth in the Ambridge, Pa., plant of American Bridge where he learned to lay out shapes for bridges and buildings. Rising through the ranks, he was appointed general superintendent of the Ambridge shops in 1923, in which capacity he supervised the fabrication of steel for the Empire State Building, the San Francisco-Oakland Bay Bridge, Radio City and many other skyscrapers and bridges. Elected vice-president and director of American Bridge six years ago, he was in charge of the company's manufacturing operations during the war.

Austin J. Paddock has been manager of the Gary, Ind., plant since 1941. A native of Detroit, Mich., he joined American Bridge in 1929 as a timekeeper with the erecting department in California, was appointed assistant to the manager of the Elmira, N.Y., plant in 1934, and three years later was made manager.

Obituary

Ross M. Blackburn, district manager at Chicago for the Buda Company, died at the Presbyterian hospital in that city on July 25, following an operation.

Herbert N. West, vice-president of the Weir Kilby Corporation, whose death on June 18 was reported in the July issue, was born at Wellston, Ohio, in 1892, and was a graduate of the University of Cincinnati. He served for a time with the engineering and maintenance of way departments of the Baltimore & Ohio, resigning in 1919 to enter the service of the company with which he was connected at the time of his death.

Oxyacetylene Flame and Electric Arc—The Air Reduction Sales Company, New York, has published a 28-page illustrated booklet on efficient ways of doing maintenance of way work with the oxyacetylene flame and the electric arc. It discusses such operations as rebuilding battered rail ends, heat treating rail ends, reconditioning worn frogs and switch points, butt welding rails, welding wheel burns, making compromise bars, repairing bridges by welding, and flame-cleaning of steel structures.

ALPHABETICAL INDEX TO ADVERTISERS, AUGUST, 1946

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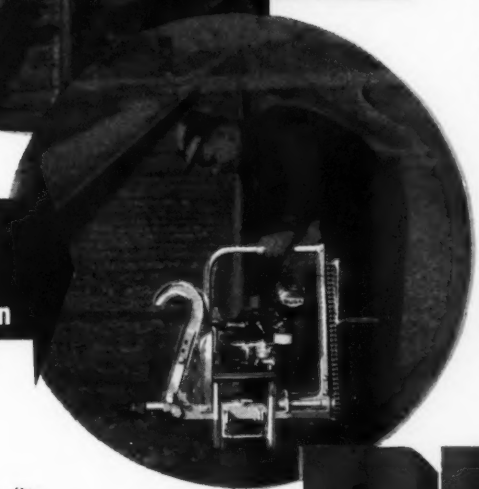

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